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TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1893.

No. 336.

HENRIETTA LOUISE LUTZ AND HORACE E. DEMING, ADMINISTRATORS OF THE GOODS, CHATTELS, AND CREDITS OF LOUIS LUTZ, DECEASED, PLAINTIFFS IN ERROR,

vs.

DANIEL MAGONE, COLLECTOR OF THE PORT OF NEW YORK.

IN ERROR TO THE CIRCUIT COURT OF THE UNITED STATES FOR THE SOUTHERN DISTRICT OF NEW YORK.

FILED OCTOBER 28, 1890.

(14,393.)

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1 UNITED STATES OF AMERICA, *ss:*

Seal of U. S. Circuit Court, South. Dist. New York.

The President of the United States to the judges of the circuit court of the United States for the southern district of New York, Greeting:

Because in the records and proceedings and also in the rendition of the judgment of a plea which is in the said circuit court, before you, between Henrietta Louise Lutz and Horace E. Deming, administrators of the goods, chattels, and credits of Louis Lutz, deceased, plaintiffs, and Daniel Magone, defendant, a manifest error hath happened, to the great damage of the said plaintiffs, as by their complaint appears, we, being willing that the error, if any hath been, should be duly corrected and full and speedy justice done to the parties aforesaid in this behalf, do command you, if judgment be therein given, that, under your seal, distinctly and openly, you send the record and proceedings aforesaid, with all things concerning the same, to the Supreme Court of the United States, together with this writ, so that you may have the same at Washington on the third Monday of October term, eighteen hundred and ninety, in the said Supreme Court to be then and there held, that, the record and proceedings aforesaid being inspected, the said Supreme Court may cause further to be done thereon to correct that error what of right and according to the laws and customs of the United States should be done.

Witness the Honorable Melville W. Fuller, Chief Justice of the said Supreme Court, the eighth day of October, in the year of our Lord one thousand eight hundred and ninety.

JOHN A. SHIELDS, *Clerk.*

The foregoing writ is hereby allowed.

E. HENRY LACOMBE, *Judge.*

2 [Endorsed:] E. & A. A. 938. N. S. 12904. U. S. Supreme Court. Henrietta Louise Lutz *et al.*, plaintiffs in error, against D. Magone, defendant in error. Writ of error. Comstock & Brown, attorneys for plaintiffs in error. Due service of a copy of the within writ of error is hereby admitted this 15th day of October, 1890. Edward Mitchell, attorney for defendant in error. S. U. S. circuit court. Filed Oct. 15, 1890. John A. Shields, clerk. 1.45 ch's.

UNITED STATES OF AMERICA, *Southern District of New York,* } *ss:*

I, John A. Shields, clerk of the circuit court of the United States of America for the southern district of New York, in the second circuit, by virtue of the foregoing writ of error and in obedience thereto, do hereby certify that the following pages, numbered from three to fifty-eight, inclusive, contain a true and complete transcript of the records and proceedings had in said court in the case of Hen-

rietta Louise Lutz and Horace E. Deming, administrators of the goods, chattels, and credits of Louis Lutz, deceased, plaintiffs in error, against Daniel Magone, defendant in error, as the same remain of record and on file in said office.

In testimony whereof I have caused the seal of the said court to be hereunto affixed, at the city of New York, in the southern district of New York, in the second circuit, this 18th day of October, in the year of our Lord one thousand eight hundred and ninety, and of the Independence of the United States the one hundred and fifteenth.

Seal of U. S. Circuit Court, South. Dist. New York.

JOHN A. SHIELDS, *Clerk.*

3 Superior Court of the City of New York.

LOUIS LUTZ, Plaintiff,
against
DANIEL MAGONE, Collector of the Port of New York, Defendant.
} Summons.

To the above-named defendant:

You are hereby summoned to answer the complaint in this action and to serve a copy of your answer on the plaintiff's attorney within twenty days after the service of this summons, exclusive of the day of service, and in case of your failure to appear or answer judgment will be taken against you by default for the relief demanded in the complaint.

Dated September 4, 1888.

COMSTOCK & BROWN,
Plaintiff's Attorney-.

Offices and post-office address No. 44 Broadway, New York city.

4 [Endorsed:] N. S. 12904. Superior court of the city of New York. Louis Lutz *vs.* Daniel Magone, collector of the port of New York. Copy summons. Comstock & Brown, plaintiff's attorney-, 44 Broadway, New York. Due service hereof admitted this — day of ——, 18—. Personally served Sep. 4, 1888, custom-house, New York. Received U. S. attorney's office Sep. 6, 1888.

5 N. Y. Superior Court.

LOUIS LUTZ
versus
DANIEL MAGONE.
} Notice of Appearance and Demand.

You will please take notice that I am retained by and appear as attorney for the defendant in this action and demand service of a bill of particulars of the plaintiff's claim herein and a copy of the complaint and all papers in this action upon me, at my office, in the

United States court and post-office building, in the city of New York.

Yours, STEPHEN A. WALKER,
United States Attorney, Attorney for Defendant.

New York, Sept. 14, 1888.
To Comstock & Brown, Esq., attorney- for plaintiff.

6 [Endorsed:] 12904. N. Y. superior court. Louis Lutz *versus* Daniel Magone. Notice of appearance. Stephen A. Walker, United States attorney, attorney for defendant. Due service of a copy of the within notice is hereby admitted. Dated the 14th day of Sept. 1888. Comstock & Brown, plaintiff's attorneys. To C. & B., plaintiff's attorney-.

7 The President of the United States of America to the judges of the superior court of the city of New York, Greeting:

[L. S.] We, for certain reasons, being desirous that our circuit court of the United States for the southern district of New York, in the second circuit, shall be certified of a certain cause commenced before you against Daniel Magone, defendant, by Louis Lutz, plaintiffs, do therefore command you that the record and proceedings in the said cause you distinctly and openly send to the said circuit court, at the city of New York, on the 29th day of Sept., 1888, as fully and amply as the same are remaining before you, by whatever names the said parties may be called therein, together with this writ, that our said court may cause to be further done thereupon what of right ought to be done.

Witness Hon. Melville W. Fuller, Chief Justice of the Supreme Court of the United States, the 24 day of Sept., in the year one thousand eight hundred and eighty-eight.

JOHN A. SHIELDS, *Clerk.*

STEPHEN A. WALKER,
United States Attorney, Attorney for Defendant.

8 [Endorsed:] 12904. U. S. circuit court. Louis Lutz *vs.* Daniel Magone. Copy certiorari. Stephen A. Walker, U. S. attorney, attorney for defendant. Take notice that the within is a copy of a certiorari this day issued out of the circuit court of the United States for the southern district of New York. New York, Sept. 24, 1888. Yours, Edward Mitchell, U. S. attorney, attorney for defendant. To C. & B., plaintiff's attorney-. Due service of a copy of the within and of the above notice is hereby admitted. New York, Sept. 24, 1888. Comstock & Brown, plaintiff's attorney-.

9 Folio 1.

United States Circuit Court, Southern District of New York.

LOUIS LUTZ, Plaintiff,
vs.
DANIEL MAGONE, Collector of the Port of New York, Defendant. } Complaint.

Plaintiff complains

1. That defendant was, at the times of the exactions herein complained of, collector of customs of the United States at the port of New York.

2. That the plaintiff was during such times a merchant doing business in the city of New York and elsewhere under the firm name of Lutz & Movius, and as such duly imported and entered at the port of New York the goods described in the bill of particulars hereto annexed.

3. That the plaintiff in order to obtain said goods, was compelled to pay the defendant as such collector the sum of one thousand one hundred dollars in excess of the lawful rate of duty on said goods, and of the amount required by law.

4. That plaintiff filed with the collector due and timely protest in writing upon each entry of said goods against the decision exacting such duty, setting forth distinctly and specifically the grounds of objection thereto.

5. That plaintiff made due and timely appeal on each entry to the Secretary of the Treasury, whose decision on each appeal was either rendered within ninety days previous to the commencement of this action, or delayed more than ninety days subsequent to the date of lodging such appeal and previous to the commencement of this action, except as to payments of duty herein complained of made after the Secretary's decision on an appeal therefrom, and that as to all such payments this action was commenced within ninety days thereafter.

9½ 6. That the bill of particulars hereto annexed states for each importation separately the date of entry at the custom-house, of payment of duty in excess, of the filing of said protest, of the appeal to the Secretary of the Treasury, and of his decision thereon, if rendered, together with other particulars required by law, and is made a part hereof.

7. That said sum so exacted as aforesaid, has never been repaid to plaintiff, and is still due and owing to him.

Wherefore plaintiff demands judgment against defendant for the sum so exacted as aforesaid, with interest on the several sums named in the bill of particulars, from the respective dates of payment as appear thereby, together with the costs and disbursements of this action.

COMSTOCK & BROWN,
Plaintiff's Attorney-, 44 *Broadway, New York.*

Name of importers: Lutz & Movins.

Description of goods.	Whence imported.	Name of vessel.	Date of invoice.	Date of entry at custom-house.	Amount of duty exacted in excess.	Date of payment of duty in excess.	Protest filed.	Appeal filed.	Date of Secretary's decision.
Saccharine....	Hamburg....	Hammonia	Aug. 30, '87	Sep. 16, '87	$550 00	Sep. 16, '87	M'ch 8, '88	M'ch 8, '88	June 7, '88
Do.	do.	Trave	Oct. 1, "	Oct. 15, "	550 00	" 29, " Oct. 15, "	Ap'l 2, "	Ap'l 2, "	Aug. 13, "
					$1,100 00				

11 [Endorsed:] No. 12904. United States circuit court, southern district of New York. Louis Lutz, plaintiff, *vs.* Daniel Magone, collector of the port of New York, defendant. Copy complaint and bill of particulars. Comstock & Brown, plaintiff's attorneys, 44 Broadway, New York. To Stephen A. Walker, Esq., U. S. att'y, att'y for def't. Received, U. S. attorney's office, Oct. 13, 1888.

12 Circuit Court of the United States for the Southern District of New York.

LOUIS LUTZ *et al.*
versus
DANIEL MAGONE, Collector, etc. } N. S. 12904.

The defendant answers to the complaint as follows:

I. He denies that the true duty, or that the true and lawful rate of duty, on the goods referred to in the complaint, was as stated in the complaint; and he denies that the plaintiffs were compelled to pay or did pay to the defendant as collector or otherwise the sum stated in the complaint, or any sum in excess of the amount required by law as duties upon the said goods, or that any sum of money unauthorized by law was exacted as duties on said goods or otherwise, or that the same was paid in order to obtain possession of said goods.

II. He denies that the plaintiffs filed with the defendant any protest or protests as required by section 3011 of the Revised Statutes of the United States.

III. He denies that the sum stated in the complaint or any sum is now due and owing the plaintiffs.

IV. He denies that he has any knowledge or information sufficient to form a belief as to whether the goods alleged in the complaint to have been imported at the time therein mentioned were in fact such goods as are described in the said complaint.

V. And further answering, he alleges that no protest was filed within ten days after the ascertainment and liquidation of the duties thereon.

VI. And further answering, he alleges that no appeal was taken to the Secretary of the Treasury within thirty days after the date of the ascertainment and liquidation of duties thereon.

VII. And further answering, he alleges that this action was not brought within ninety days after the decision of the Secretary of the Treasury on the appeal taken from the ascertainment and liquidation of duties thereon; or within ninety days after payment of duties paid thereon after such decision.

VIII. And further answering, he alleges that this action was brought without the decision of the Secretary of the Treasury on the appeal from the ascertainment and liquidation of duties thereon having been first had and without ninety days having elapsed from the date of such appeal.

IX. And further answering, the defendant alleges that all moneys received by him from the plaintiffs, in respect of the importations

in the complaint alleged to have been made, were demanded of the plaintiffs and were by the plaintiffs voluntarily paid to him in his capacity as collector of customs as and for duties due the United States on imported merchandise, and were forthwith before the commencement of this action and before the receipt by defendant of any protest or objection on the part of the plaintiffs paid over by the defendant in his official capacity aforesaid to the United States and placed beyond his control.

X. And further answering, the defendant alleges that all moneys received by him from the plaintiffs, in respect of the importations in the complaint alleged to have been made, were sums due from the plaintiffs to the United States as duties, according to the rate of duty imposed by law, upon articles of merchandise imported by plaintiffs and assessed with duty, and no other sums than duties regularly assessed and ascertained and liquidated according to law upon the plaintiffs' entry thereof were collected or received by defendant from the plaintiffs.

Wherefore defendant demands judgment, that the complaint be dismissed with costs.

STEPHEN A. WALKER,
United States Attorney, Attorney for the Defendant.

13 [Endorsed:] 12904. U. S. circuit court, southern district of New York. Louis Lutz *vs.* Daniel Magone, collector, etc. Copy answer. Stephen A. Walker, United States attorney, attorney for defendant. Sirs: Please to take notice that the within is a copy of an answer this day filed in the office of the clerk of the circuit court of the United States for the southern district of New York. Dated New York, Dec. 14, 1888. Yours, &c., Stephen A. Walker, U. S. att'y & att'y for def't. To Comstock & Brown, attorneys for plaintiffs. Due service of a copy of an answer of which the within is a copy, and of the above notice, is hereby admitted. Dated New York, Dec. 14, 1888. Comstock & Brown, attorneys for plaintiffs.

14 United States Circuit Court, Southern District of New York.

Louis Lutz, Plaintiff, *vs.* Daniel Magone, Collector of the Port of New York, Defendant.	Nos. 12904 and 14375.
Louis Lutz, Plaintiff, *vs.* Joel B. Erhardt, Collector of the Port of New York, Defendant.	No. 15176.

On reading and filing the annexed affidavit of Albert Comstock, sworn to on the 8th day of January, 1890, whereby it appears that the above-named Louis Lutz died on or about the 10th day of October, 1889, and the annexed certificate of the surrogate for the county of New York, whereby it appears that on the 15th day of

November, 1889, letters of administration on the goods, chattels, and credits of the said Louis Lutz, deceased, were granted to Henrietta Louise Lutz and Horace E. Deming, administrators of the estate of said deceased, and on motion of Messrs. Comstock & Brown, counsel for the said administrators, Edward Mitchell, Esq., U. S. attorney and attorney for the defendant herein, appearing and consenting thereto—

15 It is ordered that Henrietta Louise Lutz and Horace E. Deming, administrators of the goods, chattels, and credits of Louis Lutz, deceased, be, and the same are hereby, substituted as plaintiffs in the above-entitled actions in the place and stead of the said Louis Lutz, deceased.

Dated New York, January 9th, 1890.

E. HENRY LACOMBE.

16 United States Circuit Court, Southern District of New York.

LOUIS LUTZ, Plaintiff,
vs.
DANIEL MAGONE, Collector of the Port of New York, Defendant. } Nos. 12904 and 14375.

LOUIS LUTZ, Plaintiff,
vs.
JOEL B. ERHARDT, Collector of the Port of New York, Defendant. } No. 15176.

STATE OF NEW YORK, *City and County of New York,* } *ss.:*

Albert Comstock, being duly sworn, deposes and says that he was well acquainted with the above-named Louis Lutz for several years prior to the 10th day of October, 1889; that on or about said date said Louis Lutz departed this life; that, as appears by the annexed certificate of the surrogate of the county of New York, letters of administration on the goods, chattels, and credits of the said Louis Lutz, deceased, were granted to Henrietta Louise Lutz and Horace E. Deming, both of the city of New York, on the 15th day of November, 1889.

ALBERT COMSTOCK.

Sworn to before me this 8th day of January, 1890.

DANIEL E. DELEVAN,
Notary Public, N. Y. Co.

17 Endorsed: Copy. U. S. circuit court, southern dist. of New York. Nos. 12904, 14375, 15176. Louis Lutz *vs.* Daniel Magone, collector, &c., and Same *vs.* Joel B. Erhardt, collector, &c. Affidavit, certificate, and order of substitution. Comstock & Brown, pl'ff's att'ys, 44 Broadway, New York. Received, U. S. attorney's office, Jan. 10, 1890.

Edward Mitchell, Esq., U. S. att'y & att'y for def't.

SIR: Please to take notice that an order of which the within order is a copy was this day entered in the clerk's office of this court in each of the three actions within specified.

Yours, &c., COMSTOCK & BROWN,
Pl'ff's Attorneys.

Dated New York, Jan'y 9, 1890.

18 At a stated term of the circuit court of the United States of America for the southern district of New York, in the second circuit, held at the United States court-rooms, in the city of New York, on Tuesday, the 14th day of January, in the year of our Lord one thousand eight hundred and ninety.

Present: The Honorable E. Henry Lacombe, circuit judge.

HENRIETTA LOUIZE LUTZ and HORACE E. DEMING, Administrators of the Goods, Chattels, and Credits of Louis Lutz,
vs.
DANIEL MAGONE. } N. S. 12904.

Now come the plaintiffs, by Everett Brown, Esq., their attorney, and move the trial of this cause. Likewise comes the defendant, by Thomas Greenwood, Esq., assistant United States attorney, his attorney.

Thereupon a jury is empanelled and the cause proceeds to trial.

After hearing the evidence of the respective parties and the argument of counsel the jury, by direction of the court, say that they find a verdict for the defendant, and so they say all.

On motion of Albert Comstock, Esq., ordered that the defendant have a stay of sixty days in which to make and serve a case, with leave to turn the same into a bill of exceptions.

An abstract of the minutes.

[L. S.] JOHN A. SHIELDS, *Clerk.*

19 United States Circuit Court, Southern District of New York.

HENRIETTA LOUISE LUTZ and HORACE E. DEMING, Administrators of the Goods, Chattels, and Credits of Louis Lutz,
vs.
DANIEL MAGONE. } Judgment.

The issues in this action having been brought on for trial before Mr. Judge E. Henry Lacombe and a jury, at a circuit court of the October term, 1889, and the issues having been tried, and a verdict for the defendant having been duly rendered on the 14th day of January, 1890, and his costs having been adjusted at $48.85—

Now, on motion of Edward Mitchell, United States attorney, for defendant,

It is adjudged that the defendant have judgment against the

plaintiffs upon the issues in this action, and that he recover the sum of $48.85, his taxed costs, and have execution therefor.

Judgment signed this 25 day of September, 1890.

JOHN A. SHIELDS, *Clerk.*

20 [Endorsed:] N. S. 12904. United States circuit court. Henrietta Louise Lutz and Horace E. Deming, administrator- of the goods, chattels, and credits of Louis Lutz, *vs.* Daniel Magone. Judgment-roll. Edward Mitchell, United States attorney, attorney for defendant. U. S. circuit court. Filed Sept. 25, 1890, 11.15 a. m. John A. Shields, clerk.

21 United States Circuit Court, Southern District of New York.

HENRIETTA LOUISE LUTZ and HORACE E. DEMING, as Administrators, &c., of Louis Lutz, Deceased, *against* DANIEL MAGONE. } N.S. 12904.

Bill of Exceptions.

Afterwards, to wit, on the 14th day of January, 1890, at a stated term of this court, begun and holden on the third Monday of October, 1889, before the Honorable E. Henry Lacombe, a circuit judge of the United States for the southern district of New York, said issues so joined as between the parties aforesaid, as by the record more fully appears, came on to be tried by a jury duly impanelled and sworn for that purpose; the plaintiffs being represented by Mr. Albert Comstock and Mr. Everit Brown and the defendant by Mr. Edward Mitchell, United States attorney, and Mr. Thomas Greenwood, assistant United States attorney.

During the course of the trial said counsel for the plaintiffs did take and allege sundry exceptions to the rulings, direction, charges, and instructions of the court, and to its refusal to give certain instructions and directions to the jury as then and there prayed for by them, which said exceptions are hereinafter severally set forth.

22 To maintain the issues on the part of the plaintiffs they introduced testimony tending to show that during the year 1887 the plaintiffs' intestate, one Louis Lutz, doing business under the name of Lutz and Movius, made two importations of saccharine from Germany into the port of New York; that this saccharine was classified for duty as a "chemical compound" under the provision for "all chemical compounds, by whatever name known, not specially enumerated or provided for" contained in schedule "A" of the tariff act of March 3, 1883, 22 U. S. Statutes, 488, and pursuant to that provision duty thereon at the rate of twenty-five per centum ad valorem was exacted of the said plaintiffs' intestate by the defendant as collector of customs at that port. Against this classification and exaction said plaintiffs' intestate made due and seasonable protest as to each of said importations, in which he claimed that this sac-harine was entitled to entry free of duty as an

"acid used for medicinal, chemical, or manufacturing purposes, not specially enumerated or provided for" under the provision for such acids contained in the free list of the aforesaid tariff act.

Thereafter said plaintiffs' intestate duly and seasonably made appeal to the Secretary of the Treasury as to each of said importations, and within ninety days after adverse decisions were rendered by the Secretary upon such appeals duly brought this suit to recover the duties exacted of him as aforesaid.

Plaintiffs then produced as a witness in their behalf
23 CHARLES SCHMIDT, who, being duly sworn, testified that he was a book-keeper and chemist, and as such had been employed by the plaintiffs' intestate, doing business under the name of Lutz & Movius, and since the decease of said plaintiffs' intestate he had been employed as such by the plaintiffs' intestate successors, J. Movius & Son; that he was acquainted with the business of J. Movius & Son, and had been familiar with that of the plaintiffs' intestate; that he has studied chemistry for four or five years in Germany and had practiced the profession of chemistry since that time in the United States; that in the course of his business relations with said plaintiffs' intestate and with his successors, J. Movius & Son, he was acquainted with the article imported by them and known as saccharine; that he was acquainted with the use to which it was applied and with the properties that it possessed; that a sample of saccharine shown to the witness (which was subsequently admitted in evidence and marked Ex. S) was a fair representative sample of such saccharine as was in suit and such saccharine as was imported by the plaintiffs' intestate and by his successors, J. Movius & Son; that, chemically, sample S was an acid, as found by him on subjecting it to the proper chemical test; that he knew the use to which saccharine like sample S was applied; that it was used as a sweetening agent in manufacturing purposes, such as soda water, mineral water, liquors, wines, chewing tobacco, medicines, &c.; that the chief use to which it was applied was for manufacturing; that those
24 uses largely preponderate over every other possible use.

On cross-examination this witness testified that saccharine put up for the trade by plaintiffs' intestate and by his successors, J. Movius & Son, was like sample S, to wit, a dry, white powder, sweet to the taste; that it was always put up in paper. The witness was then shown a label, to wit, "Dr. Fahlberg's saccharine; patented; Lutz & Movius, 15 Warren street, New York, sole agents for the U. S. A. and Canada," and, on being asked whether this was the label that was usually put on the papers containing saccharine like the sample S, answered that it was mostly only used for samples; what they send out as samples. The witness was then asked the following question:

Q. If a person, from such a sample as that, were to order a quantity, what would be placed with it? Any circular?

To this question the plaintiffs objected on the ground that the same was irrelevant; which objection was overruled, and to this ruling the plaintiffs' counsel duly excepted.

The witness then answered, "If he asked for a circular he would get it; if he did not ask for it he would not."

This witness further testified:

That saccharine was worth from thirteen to fifteen dollars a pound; that when bought in quantities of a pound each it was put in one-pound tins; that the one-pound tins had thereon a
25 label on which were the words, "Dr. Fahlberg's saccharine," but he did not think that the word "patented" was on such label; that this saccharine was called "Dr. Fahlberg's saccharine" because it was invented by Dr. Fahlberg. The witness was then asked the following questions:

Q. Do you know whether he (Dr. Fahlberg) has several patents on saccharine obtained in the United States?

To this question plaintiffs' counsel objected on the ground that the same was irrelevant; which objection was overruled, and to this ruling the plaintiffs' counsel duly excepted.

The witness answered—

A. Yes.

In answer to the question whether a one-half interest was assigned by Dr. Fahlberg to Adolph List, who took out a patent, the witness answered, "No, sir." The witness being then shown a circular and asked if that was a circular that the plaintiffs' intestate, doing business under the name of Lutz & Movius, had issued in connection with the saccharine sold by him, answered, Yes. This circular was then, at the request of the defendant's counsel, marked "Exhibit S—Circular, for Identification."

This witness further testified, on cross-examination, that he was pretty familiar with the article saccharine like sample S; that he could give the chemical constitution of it, but could not give
26 the chemical formula of it; that he knew that it was an acid by the tests which he had made; that in making these tests he had put blue litmus paper into a solution of saccharine, and it had been turned red. The witness, on being asked whether an anhydrid would not do the same—turn litmus paper red—answered that, to his knowledge, only acids would turn such litmus paper red; that he knew about anhydrids; that an anhydrid was a substance which did not contain any water, it was free from water, and the witness, on being asked whether gunpowder would not be an anhydrid, being a substance free from water, answered yes, and that that answered his definition of an anhydrid; but he did not know whether he would call it an anhydrid or not; that an acid was a substance which formed, with a basic body, a chemical salt; that there was sometimes water in it and sometimes not; that, to the best of his knowledge, he would swear that saccharine like sample S was an acid. The witness being asked if he had read the statements in "Exhibit S—Circular, for Identification," answered yes, and testified that, to the best of his knowledge, all such statements were true.

Q. You say that this (saccharine like sample S) is used in manufacturing purposes?

A. Yes.

Q. How? You mentioned soda-water. Do they make soda-water out of it?

A. They use it for sweetening soda-water.

Q. How do they use it in liquors? Do they make liquors out of it?

A. They use it to sweeten liquors.

27 Q. How about wine; do they make wine out of it?

A. No, sir.

Q. How do they use it?

A. They use it to sweeten wine.

Q. And in the case of tobacco, do they make tobacco out of it?

A. No, sir.

Q. What do they do with it?

A. They use it to sweeten tobacco.

Q. You spoke about medicine; is it used for the same purpose in medicine—to sweeten medicine?

A. Yes.

Q. To disguise the bitter and disagreeable taste?

A. Yes.

Q. You don't make medicine out of it, do you?

A. No.

Q. Is it not a medicine?

A. It is not a medicine.

Q. How about liquorice; they do not make liquorice out of it, do they?

A. No, sir.

Q. They use it there for sweetening?

A. Yes.

Q. Are there any other purposes that you call manufacturing purposes for which it is used—I mean where it is not used simply to sweeten?

A. I do not know of any.

Q. You do not know of any in which it is not used simply to sweeten?

A. No.

Q. This is how many times sweeter than sugar cane?

A. About three hundred times.

28 This witness on redirect examination testified that acids were of three forms—gas, liquid, and amorphous; that acids came in crystalline form; that amorphous meant being in powder; that he knew of acids called anhydrid acids; that anhydrid meant free from water; that an acid might be at the same time an acid and an anhydrid; that the fact that it was an anhydrid did not conflict with its being an acid or the fact that it was an acid conflict with the fact of its being an anhydrid; that in chemistry the term "acid anhydrid" was exactly synonymous with the term "anhydrous acid;" that an anhydrid to his knowledge was an acid

which was free from water, or, in other words, a waterless acid. that the word "anhydrid" meant free from water; that the chemical name of saccharine was orthosulphamin benzoic acid anhydrid; that the term "anhydrid orthosulphamin benzoic acid" meant in chemistry the same thing; that saccharine like sample S was used in the manufacture of various articles, such as liquors, preserves, chewing tobacco; that it was used to sweeten; that in stating that saccharine was used in the manufacture of tobacco he did not mean that it was used in producing the tobacco from the leaf, but in producing a merchantable quality of tobacco; that it was not used in the actual manufacture of liquors, but it was used in the preparation of liquors to make them merchantable, and that it was so used in all the other things in which he had said it was used.

This witness on recross-examination testified that he still adhered to his testimony that saccharine like sample S was used in the different articles mentioned by him simply to sweeten.

29 The plaintiffs then produced as a witness in their behalf FREDERICK HOFFMAN, who, being duly sworn, testified that he was a professional chemist and editor of a journal of chemistry; that he had been engaged in chemistry thirty years, having studied in the University of Berlin, and had written and published several technical books on chemistry; that he was familiar with chemical compounds generally and with acids and salts and their various tests and formulæ; that he was familiar with an article known as saccharine; that Plaintiffs' Exhibit S was saccharine; that there was only one manufactory in the world at which saccharine was made, and that that was in Hamburg or near Mecklinburg; that he was acquainted with the tests applied to that article to determine whether it was an acid or not; that he had applied tests to it for that purpose; he had put it in a combination with an alkaline, such as bicarbonate of soda; that it had neutralized it; it effervesced, and the carbonic acid was set free and saccharine formed; that the result of such tests was to show that it was chemically an acid, possessing the properties of an acid and known to chemistry as such; that the process of manufacturing it was one of the most complicated of chemical processes and very expensive; that the process was not a secret one; that the chemical formula for saccharine was very complicated; no one could remember it, but it is in every text book; that all that the chemist in examining saccharine would do would be to ascertain if it was really an acid and
30 its use for manufacturing purposes; that the different purposes for which it was useful were for sweetening in food, including milk; that it was useful for sweetening preparations like liquorice, tobacco, preserves, and many other such things; the products of art and industry; for food and drinks; that that was its main use; that it was used in medicine to cover the bitter taste, but that it had no medicinal effect on the human or animal system.

This witness, on cross-examination, testified that the only use of

saccharine was for sweetening; that he thought that no chemist in the United States had analyzed saccharine; that it was a new product, manufactured only by the patentee, in one factory, and that there was no object to any chemist to analyze it; that he claimed that no chemist in this country either ever had manufactured or will manufacture it or will analyze it, but that every student in the colleges of this country knew exactly what saccharine was, just as he did; that it is only used in the manufacturing industries; that anhydrid was a term used in chemistry which really meant very little; that it meant free of water; that sulphuric acid or carbonic acid was in all three stages; that it was entirely immaterial in any case; that it meant that in the present condition, as an anhydrid, it was free from water or freed of water; that all acids are anhydrid; sulphuric acid was known in an anhydrid state, like snow; that carbonic acid was manufactured in a liquid form; that if you open a cylinder of it it comes out as snow—anhydric carbonic acid; that when water is taken out of an acid it was an anhydrid in a
31 theoretical, but not in a practical, sense; that the noun, not the adjective, anhydrous was a theoretical expression; that most acids were known in all three states—anhydrous, neutral, and with water; that there was no difference between an anhydrid and an acid anhydrid; that in chemistry anything was called an acid that had the decided characteristics of an acid, and a simple test for determining if the thing was an acid, which any man could make, was with bicarbonate of soda.

The witness, on redirect examination, testified that he was acquainted with the work on chemistry called A Treatise on Chemistry, by Roscoe & Schorlemer; that volume 3, part IV, pages 268, 269 of that treatise gave the formula for the manufacture of saccharine; that that treatise was a standard work in Great Britain and America; that the formula given in that treatise was the formula given in the letters patent granted for the manufacture of saccharine.

Plaintiffs' counsel then offered in evidence pages 268 and 269 of volume 3, part 4, of the aforesaid treatise for the purpose of showing that saccharine is there classed as an acid; to the introduction in evidence of which pages and each of them the defendant's counsel objected on the ground that they were incompetent. This objection was sustained, and to this ruling plaintiffs' counsel duly excepted.

After evidence showing that the amount of duties exacted on the saccharine in suit was $1,074.50 and the interest thereon to
32 the date of trial $73.77, amounting in all to the sum of $1,148.27, the plaintiffs rested their case.

Defendant's counsel then offered in evidence the circular of the plaintiffs' intestate, doing business under the name of Lutz & Movius, heretofore marked "Exhibit S, circular, for identification," which circular was received in evidence and marked Exhibit S, circular. A copy thereof is annexed at the end of this bill of exceptions and marked Exhibit S, circular.

Defendant's counsel then offered in evidence a certified copy of letters patent granted to Fahlberg and List, dated June 2, 1885,

numbered 319,082, for improvements in the manufacture of saccharine compound. To the introduction in evidence of these letters patent plaintiffs' counsel objected on the ground that they were irrelevant; which objection was overruled, and to this ruling the plaintiffs' counsel duly excepted.

These letters patent were then received in evidence and marked Exhibit A. A copy thereof is annexed at the end of this bill of exception and marked Exhibit A.

Defendant's counsel then offered in evidence a certified copy of letters patent granted to Dr. Fahlberg, September 15, 1885, No. 326,281, for improvement in saccharine compounds. To the introduction in evidence of these letters patent plaintiffs' counsel made the same objection as before stated; which objection was overruled, and to this ruling the plaintiffs' counsel duly excepted.

33 These letters patent were then received in evidence and marked Exhibit B. A copy thereof is annexed at the end of this bill of exceptions and marked Exhibit B.

Defendant's counsel then offered in evidence a certified copy of letters patent granted to Fahlberg and List, dated December 1, 1885, No. 10667, for improvement in the manufacture of saccharine compound. To the introduction in evidence of these letters patent plaintiffs' counsel made the same objection as above stated; which objection was overruled, and to this ruling the plaintiffs' counsel duly excepted.

These letters patent were then received in evidence and marked Exhibit C. A copy thereof is annexed at the end of this bill of exceptions and marked Exhibit C.

Defendant's counsel then called as a witness in his behalf the aforesaid CHARLES SCHMIDT, who had been previously sworn, and who testified that since he was upon the stand he had found one of the tin boxes in which saccharine was put when sold by the plaintiffs' intestate, doing business under the name of Lutz & Movius and by their successors; that the labels upon the box were the usual labels put upon such boxes when saccharine was sold in them.

Defendant's counsel then offered this box and the labels thereon in evidence; to the introduction in evidence of which labels and box plaintiffs' counsel objected on the ground that the same were

34 irrelevant. This objection was overruled by the court, and to this ruling plaintiffs' counsel excepted.

The box and labels were then admitted in evidence and marked Exhibit D. A copy thereof is annexed at the end of this bill of exceptions and marked Exhibit D.

This witness having his attention called to a part of one of these labels that was circular in form and containing letters, words, &c., said that it was a stamp, the mark of the factory at which the saccharine was made; that these letters and words were "Fahlberg, List & Co., Saccharine Fabrik Salbke a | e," the last word being the name of the place where the saccharine was made; that on another part of the same label were the words "saccharine 300 mal sosuss-

als zucker," which meant "300 times as sweet as sugar;" that the words "Patente in allen landern," found on another part of the same label meant "patented in all countries;" that the words "Fahlberg, List & Co., Salbke a | Elbe," found on another part of the same label, were the names of the manufacturers of the saccharine and the name of the place at which it was manufactured.

Dafendant then produced as a witness in his behalf HAYDEN M. BAKER, who, being duly sworn, testified that he was and for the last ten years had been a chemist in the employ of the United States Government at the appraiser's stores in this city; that during that time his duties had been to examine and identify all kinds or nearly all kinds of chemical compounds imported; that for seven-
35 teen years prior to his employment by the United States Government he had been engaged in experimental chemistry and most of his efforts were directed to the study of aniline colors and the products of coal tar; that he was not a college-bred man and had never studied chemistry to the point of receiving a diploma; that he called himself a chemist by the right of his experience, and that he had a complimentary degree as doctor of medicine from the Cleveland medical college.

To the admission of expert testimony as to the nature of saccharine from this witness plaintiffs, counsel objected on the ground that he was incompetent to testify as a chemist; which objection was overruled, and to this ruling plaintiffs' counsel duly excepted. This witness testified further that he had had occasion to examine an article known as saccharine; that within the last three months he had had sample S in evidence sent to him, from which he had taken a sample of saccharine thereof for examination; that from his examination he had found that saccharine was a chemical compound; that he had seen the formulæ found in Exhibit S circular; that he was familiar with the nature of acids; that according to the understanding of chemical men those formulæ show that saccharine was an anhydrid and not an acid; that there were very many articles that were acids, as a matter of fact, such as tannic acid, acetic acid, oxalic acid, citric acid, tartaric acid, boracic acid, and other acids.

36 This witness, on cross-examination, testified that an anhydrid, as its name implied, was devoid of displaceable hydrogen or was without hydrogen; that anhydrous meant without water; that he differed from the witnesses in their proposition that anhydrid and anhydrous meant the same thing; that he was familiar with a book called the United States Dispensatory, published by Wood, Remington & Co.; that the book was a standard pharmaceutical work; that it was not a theoretical chemical book; that by "a standard pharmaceutical work" he meant it was a guide for pharmacists in the conduct of their business; that theoretical men might have the profoundest respect for that book as well as practical men; that there was a great accumulation of truth in it.

The witness, on being referred to the term "anhydro orthosulphamin benzoic acid," found under the head of "saccharine," on page

1910 of that work, was asked if, according to that book, that term was not an interchangeable term for saccharine, and testified that that term, according to that work, was another name for saccharine; that the term "anhydro orthosulphamin benzoic acid" conveyed to his mind the idea of an acid; that he could not consent to the proposition that there might be an acid properly such to which the prefix "anhydro" was applicable, or, in other words, that there were anhydro acids when that proposition referred to the existing chemical theories; that he could not recall any acids that were anhydro acids; that the word "acid" at the end of the term
37 "anhydro orthosulphamin benzoic acid" conveyed to him the idea of an acid; that an acid, when the water was removed from it, became an anhydrid; that there were quite a good many acids which were in a crystalline state; that some contained water and some contained no water, and that the idea conveyed to his mind by "orthosulphamin benzoic acid, anhydrid," was the idea of anhydrid orthobenzoic sulphanate acid.

Both sides having rested, counsel for the defendant moved the court to direct the jury to find a verdict for the defendant on the grounds (1) that the article in suit was not an acid used for medicinal, chemical, or manufacturing purposes, not specially enumerated or provided for in the tariff act of March 3, 1883; (2) that, whether or not it was an acid, it was a preparation or composition recommended to the public as a proprietary article within the meaning of that act and dutiable as such under the decision of Ferguson *v.* Arthur, 117 U. S., 482; and (3) on the ground that if it was not dutiable as such preparation or composition, then that it was dutiable as a chemical compound by whatever name known, not specially enumerated or provided for under the provision contained in paragraph 92 of said act.

This motion the court granted, and to its ruling plaintiffs' counsel duly excepted; which exception was duly noted and allowed; and thereupon the jury, in accordance with the direction of the court, found a verdict for the defendant.

38 And forasmuch as the matters, things, and exceptions aforesaid do not appear by the record, I have settled, allowed, and signed this bill of exceptions on the prayer of the said plaintiffs, by their counsel, and it is ordered that the same be filed as a part of the record herein with like force and effect as if the same had been reduced to writing, signed, and filed before the case was given to the jury.

Witness my hand at the city of New York, in the southern district of New York, this 24th day of September, 1890.

(Signed) E. HENRY LACOMBE.

39 EXHIBIT S, CIRCULAR.

Office of Lutz & Movius, importers and sole agents for the U. S., 15 Warren street, New York.

Dr. Fahlberg's Saccharine.

Among the achievements of modern chemistry the discovery and successful manufacture on a large scale of saccharine is one of the most remarkable ones, since it meets two important desiderata, hitherto not supplied by any product of nature or art, namely intense sweetness to the taste and perfect immunity to the human organism.

As the discovery of the synthesis and manufacture of saccharine by Dr. Fahlberg is of comparatively recent origin and as the method of its preparation, covered by United States patents, as well as its properties as yet are little known and sometimes misunderstood or misrepresented, we deem it pertinent and proper to briefly compile the following information.

Preparation.

The complex elementary constitution of saccharine

$$C_6H_4\!<\!\begin{matrix}CO\\SO_2\end{matrix}\!>\!NH$$

indicates that its manufacture involves a series of complicated chemical processes, only fully understood by those familiar with the principles of organic chemistry. We mention, however, the principal stages of its manufacture.

Toluol $C_6H_5CH_3$ is treated with concentrated sulphuric acid at a temperature at, or below, 212° F. The resulting products are orthotoluolsulphonic acid and paratoluolsulphonic acid:

$$C_6H_4\!<\!\begin{matrix}CH_3\\H+HO\end{matrix}\!>\!SO_3H = H_2O + C_6H_4\!<\!\begin{matrix}CH_3\\SO_3H\end{matrix}\quad\begin{matrix}(1)\\(2)\end{matrix}\quad\begin{matrix}(1)\\(4)\end{matrix}$$

Toluolsulphonic acid: Ortho. Para.

Both acids are combined with lime and the resulting lime salts, in turn, are converted into their sodium salts; they are exsiccated and the powder is mixed with phosphorus trichloride and this mixture is exposed, under constant stirring, to a current of chlorine gas. The following change takes place:

1. $$PCl_3 + 2Cl = PCl_5$$

Phosphorus trichloride. Phosphorus pentachloride.

2. $$C_6H_4\!<\!\begin{matrix}CH_3\\SO_2\end{matrix}\!\begin{matrix}P\equiv Cl_3\\O\\H+ClCl\end{matrix} = POCl_3 + HCl + C_6H_4\!<\!\begin{matrix}CH_3\\SO_2Cl\end{matrix}\quad\begin{matrix}(1)\\(2)\end{matrix}\quad\begin{matrix}(1)\\(4)\end{matrix}$$

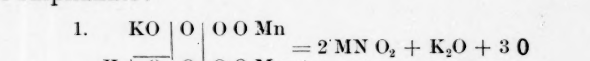
Phosphorus trichloride. Toluolsulphochloride: Ortho. Para.

When this change has been completed, the phosphorus trichloride is separated by distillation, and the remaining mixture of ortho- and para-toluolsulphochlorides is exposed to a low temperature,

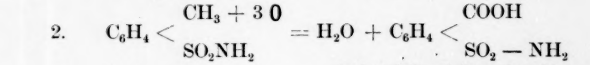
whereby the latter compound separates in crystals, whilst the orthotoluolsulphochloride remains in solution. This latter one is subsequently treated either with dry ammonia gas, or with ammoniumcarbonate or bicarbonate, whereby it is converted into orthotoluolsulphamide:

Orthotoluolsulphamide.

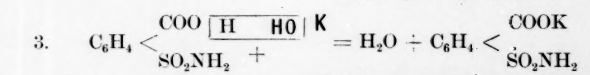
This, being little soluble in water, is readily freed from the admixture of ammonium chloride by washing it with water. It is then treated with a solution of potassium permanganate with the care to constantly neutralize the ensuing free alkali by the gradual addition of acid. The result is a solution of potassium of orthobenzoic sulphanate:



2 Mol. potassium permanganate. Manganese peroxide.

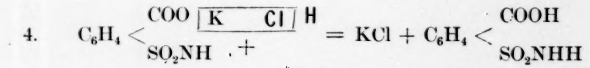


Orthosulphaminbenzoic acid.

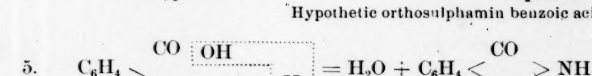


Potassium orthobenzoic sulphanate.

The solution of this salt is separated from the manganese peroxide and is then treated with hydrochloric acid; the orthosulphaminic benzoic acid is thereby separated into the elements of water and into orthosulphamin benzoic acid anhydrid, which latter one is saccharine:



Hypothetic orthosulphamin benzoic acid.



Orthosulphamin benzoic acid anhydrid.

Properties.

Saccharine is a white powder, partly of an amorphous, partly of a crystalline structure. It has a slight odor somewhat like oil of bitter almonds or essence of mirbane, which becomes very perceptible upon heating the powder from about 212° to 390° F. It is slightly soluble in cold water, requiring about 220 to 232 parts of water at 77° F. for solution; it is more soluble in hot and still more in boiling water. These solutions have an intensely sweet taste and an acid reaction upon litmus. From a saturated solution in boiling water most saccharine separates on cooling, in small crystals of

various forms, belonging to the monoclinic system. The solubility of saccharine in water is much enhanced by carefully neutralizing the acid solution with dilute solution of potassium hydrate or carbonate. If in this way a stronger solution has been obtained, the saccharine separates again upon acidulation.

Saccharine is readily soluble in alcohol, less so in ether.

The most remarkable and important property of saccharine is its intensely sweet taste, far surpassing any other known substance. Whilst the sweetness of cane sugar in solution in water ceases to be perceptible to the palate beyond the proportion of 1 part of sugar to 250 parts of water, saccharine retains its sweet taste in solutions of 1 part in 70,000 parts of water; so that it exceeds cane sugar in this property 280 times.

Another valuable property of saccharine is its perfect immunity upon the human organism; it passes through the same without being absorbed or altered, and is eliminated in the urine. This important fact has been proved by elaborate experiments on animals and by long-continued internal use of saccharine by persons in health as well as in clinical practice; any doubts in regard to its perfect immunity have been dispelled and are the more groundless, as the amount of saccharine consumed for sweetening purposes, in consequence of its intense sweetness, is an extremely minute one in any case.

An additional valuable property of saccharine is its antiseptic action, counteracting or retarding fermentation and decomposition—a property often of much value in disorders of the digestive and alimentary passages, preventing lactic fementation, etc.

Application.

Saccharine is neither a drug nor a food, but a neutral and indifferent substance, and for this reason admits of a wide range of application and usefulness in domestic economy, in medicine and in arts and industry. It will be of paramount value whenever a bitter taste has to be neutralized or counteracted in articles of food, in preserves, in beverages, in drugs and medicines, or where with the least amount of material, various shades of sweetness are to be obtained, as for instance, in wines, beer, fruit juices, canned conserves, candies, etc., as also in the manufactnre of black licorice, chewing tobaccos, chewing gums, etc.

41 In medicine it has proved of particular value, as it combines with the intensely bitter alkaloids such as quinine, morphine, etc., disguising their bitter taste almost completely. It is, moreover, an invaluable boon to all persons afflicted with diabetes; they have, as is well known, to dispense with hydrocarbons, and therefore to abstain from the use of any sugars, of starches, etc. Saccharine offers to such patients a perfectly innocuous substance to make such food palatable which they are obliged to use, and which for want of sugar is devoid of sweetness.

It needs no further instances and evidence to demonstrate the wide scope of application and the importance which saccharine offers. It will deservedly soon become a much used and highly val-

uable article in all branches of domestic econony and in many arts and industries.

Examination of and tests for saccharine.

Since such an important and, in its chemical constitution, complicated article is apt to adulteration and sophistication, we append, in conclusion, the following simple and reliable tests for ascertaining the identity and purity of saccharine, as well as for its detection in sugars.

Examination of saccharine.—It fuses at about 392° F.; when fused upon platinum foil or porcelain it emits a distinctly perceptible odor of oil of bitter almonds or essence of mirbane, and finally burns away without leaving a residue; a white residue would be evidence of the admixture of mineral adulterations.

Four grains of saccharine should render a clear solution when agitated in a test-tube with 2 drachms of concentrated sulphuric acid; upon gently heating this solution it should remain colorless; an ensuing brown or darker color would indicate an admixture of sugars or other organic adulterants.

An additional test for the admixture of grape sugar consists in dissolving 4 grains of the saccharine in 1 drachm of officinal liquor potassae, which should remain colorless upon gently heating for 15 minutes. The same solution, when mixed with ½ drachm of Fehling's test solution and heated, should not render a brick-red turbidity; else grape or milk sugar *are* indicated.

Testing sugars for saccharine.—In order to examine common sugar for an admixture of saccharine, respectively a substitution of cane sugar by grape sugar sweetened with saccharine, the following simple test is recommended: A test-tube pointed and open at the lower end (a glass syringe answers best), containing about 1 fluid ounce, is closed at the lower orifice by a piece of cork or rubber and is filled with the coarsely powdered sugar to be tested; the tube charged with the sugar is then filled with ether and is left standing for about one hour; then the lower orifice is opened and the ether allowed to flow off into a small porcelain capsule; by placing this on a moderately warm place the ether evaporates, leaving any traces of saccharine behind, which is best and very perceptibly recognized by its extremely sweet taste. It may further be recognized by fusing in the capsule containing the ether residue, at a very gentle heat, a few grains of a mixture of 6 parts of sodium carbonate and 1 part of potassium nitrate; subsequently the fuse is heated to redness. The residue, when cold, is dissolved in a little distilled water, and the filtered solution is tested with a few drops of test-solution of barium chloride. An ensuing white turbidity of barium sulphate would prove the presence of saccharine, which forms at such incineration sulphuric acid, whilst no other sulphates possibly contained in the sugar would be extracted by ether.

We trust that this brief information about this important new substance, now at first manufactured on a large scale and at a comparatively very low price, and now introduced into the American market, will prove of value and usefulness and will serve to correct

errors and misstatements as to its nature and character, and will serve to dispel any doubts or fears in regard to its perfect immunity for its general and indiscriminate application and use.

Copies of this circular and any further information will cheerfully be furnished on application to—

LUTZ & MOVIUS,
Importers and Sole Licensees of Saccharine for the United States, 15 Warren Street, New York.

Boston: 37 Pearl street.
Philadelphia: 49 North Front street.

42 EXHIBIT A.

UNITED STATES PATENT OFFICE.

CONSTANTIN FAHLBERG, of New York, N. Y., assignor of one-half to Adolph List, of Leipsic, Germany.

Manufacture of Saccharine Compounds.

Specification forming part of Letters Patent No. 319,082, dated June 2, 1885. Application filed August 7, 1884. (Specimens.) Patented in Belgium August 16, 1884, No. 66048, and in France August 16, 1884, No. 163,797.

To all whom it may concern:

Be it known that I, Constantin Fahlberg, of the city, county, and State of New York, have invented a new and useful compound called saccharine, and process of manufacturing the same, as hereinafter fully described.

My invention relates to the manufacture of a saccharine compound from toluene and other derivatives of coal-tar, which compound contains the elements of carbon, hydrogen, oxygen, sulphur, and nitrogen, and possesses a similar sweet taste as saccharose or cane-sugar. It may be used for many purposes where sugar would be too costly—for instance, in sweetening glucose, grape or starch sugar, and for other purposes where cane-sugar is used for sweetening and preserving purposes.

The invention is based upon the original researches published by myself in the American Chemical Journal, volume 1, Nos. 2 and 3, June, 1879, pages 170 to 175, and jointly by myself and Ira Remsen, in the same journal, volume 1, No. 6, pages 426 to 438, in which a saccharine compound was first described, to which the name of "benzoic sulfinide" was given.

The object of this invention is to provide a process by which said saccharine compound can be manufactured on a large scale, and cheap enough to be used in the arts.

The special characteristics of the compound are its sweetness and antiseptic properties.

The high antiseptic properties of my improved saccharine com-

pound will recommend it for many purposes in the arts and medicine. Owing to the fact that it cannot be classed under the heading of nourishments, like sugar and similar carbon hydrates, it may be used for many medical purposes in which cane-sugar is excluded from the diet, as in the case of "diabetes mellitus," and other diseases.

My improved compound does not dissolve easily in cold water. It is more soluble in warm or hot water and can be easily obtained from its aqueous solution in crystalline form. Alcohol and ether dissolve it readily. It crystallizes in thick, short prisms, in all probability belonging to the monoclinic system. The crystals, however, are small and not well formed. It fuses at about 200° Centigrade under partial decomposition. Saccharine possesses a marked sweet taste, being much sweeter than cane-sugar and sweeter than grape or starch sugar. A diluted solution of the compound tastes like a saturated solution of cane-sugar.

In an aqueous solution my improved saccharine compound forms readily salt-like compounds with the alkalies, alkaline earths or metals, similar to cane-sugar. These salts possess the same pleasant sweet taste as the compound itself. All salts of the compound crystallize badly, those of the alkalies yielding on evaporation a sirup-like mass, which is unable to crystallize even after long standing.

The saccharine compound forms, under certain conditions, with the residues of the hydrocarbons, as methyl, ethyl, propyl, &c., compounds which are termed "esters," possessing the same sweet properties as the primary compound.

The saccharine compound, being a derivative of benzoic acid, does not ferment, like grape sugar and other carbon hydrates.

Having described so far the properties and advantages of my new sweet compound, to which I have given the name "saccharine," I shall now proceed to describe the process of its preparation.

Operation 1: Saccharine is prepared from coal-tar and similar products, in particular from such products containing abundantly benzine, toluene, xylem, &c. Although toluene generally is used, for economical reasons, other substitution products of benzine and the like, which yield on oxidation or which contain without previous oxidation benzoic acid, may be used. Toluene is first treated with fuming sulphuric acid in the cold, or with concentrated sulphuric acid at a temperature of 220° Fahrenheit, and above, in leaden vessels until it is dissolved, respectively converted into the two isomeric toluene-monosulphonic acids. It has been found, however, that strong concentrated sulphuric acid, or a mixture of hydrated sulphuric acid and anhydrous sulphuric acid, is better adapted for this purpose, inasmuch as the yield of saccharine was larger than when fuming sulphuric acid was used.

Operation 2: As soon as the last trace of toluene has become converted into the two toluene-monosulphonic acids the contents of the vessel are allowed to run into wooden tanks, neutralized with chalk or carbonate of lime, and filtered through a filter-press.

43 The last traces of calcium toluene-sulphonate which persist-

ently adhere to the calcium sulphate in the filter-press are separated from it by washing it with hot water. The wash-liquor is worked together with the first liquor in the next operation.

Operation 3: All liquors of the previous operation are converted from the calcium salt into the salts of the alkalies by means of any of the known carbonates of the alkalies—for instance, into the corresponding sodium toluene-monosulphonates—by using a carbonate or bicarbonate of sodium. The carbonate of lime resulting from this operation can be filtered off by a filter-press and used again in the second operation in place of ordinary chalk. This quantity of carbonate of lime would be sufficient for a continuous preparation of calcium toluene sulphonate had it not been for an excess of sulphuric acid required in operation 1, which is to be neutralized with fresh quantities of chalk.

Operation 4: The resulting solution of the sodium salt is evaporated in open or vacuum pans until on cooling it becomes hard. The contents of the pan are then solidified by running them into iron or wooden molds. The lumps are chipped or broken by hands or machines and placed in a drying-room. To be sure that all the water from the sodium salt is removed, it is dried afterward by steam in convenient drying apparatus.

Operation 5: As soon as the sodium salts are found to be perfectly dry they are treated in an apparatus especially constructed for this purpose, with phosphor-pentachloride (most conveniently made by a method hereinafter described) in proportions to effect a complete transformation. The products formed by this operation will be two isomeric toluene-monosulphochlorides and phosphor-oxychloride. The latter is removed by distillation, collected and used in the preparation of phosphor-pentachloride, while the former, consisting of a solid and a liquid toluene-sulphochloride, are separated in a centrifugal machine or other equivalent apparatus. A frequent washing with cold water in the centrifugal machine is essential to effect a complete separation of the two toluene-sulphochlorides, inasmuch as the saccharine is only obtained from the liquid portion. The solid sulphochloride remaining in the centrifugal machine is removed and converted by a method given below into toluene, hydrochloric, and sulphurous acids. The former is used for the preparation of fresh quantities of toluene-sulphonic acids, the latter for the manufacture of phosphor-pentachlorides or for the separation of saccharine from its salts. The liquid sulphochloride is cooled by ice to separate the last traces of the solid portion, placed again in a centrifugal machine, and finally converted into the amid.

Operation 6: The liquid toluene-sulphochloride is converted either by caustic or carbonate of ammonia, preferably by the latter, into toluene-sulphamid. For this purpose the liquid sulphochloride and the solid carbonate of ammonia are mixed together in proper proportions and exposed to heat, so as to effect the transformation, during which carbonic-acid gas is given off. The remaining mass contains the amid with a certain quantity of ammonium chloride.

Operation 7: The amid, after being separated by a centrifugal

machine, is oxidized by means of any of the known oxidizing agents in an alkaline solution, and yields a salt of saccharine, which corresponds with regard to its base to the base of the oxidizing agent. Such oxidizing agents are numerous; but preferably permanganates and plumbic dioxide are used.

In making use of the permanganates the result of the oxidation will be a salt of saccharine, hydrated manganese dioxide, and a free alkali or a carbonate of an alkali. The insoluble hydrated manganese dioxide can be easily separated from the alkaline solution containing the salt of saccharine by means of a filter or any other convenient method, and converted by any of the known methods into permanganates and used for subsequent oxidation of toluene sulphamid. The slightly alkaline solution containing the salt of saccharine can be neutralized by an acid, and finally evaporated to any desired consistency. The slightly impure product will be found to possess a pleasant sweetness. In order to prepare the pure saccharine therefrom, the concentrated solution of the salt is treated with either hydrochloric or sulphuric acid and the precipitate dissolved and crystallized. It yields in this way a colorless and finely-crystallized product of characteristic sweetness. The precipitation with strong acids is connected with great loss, caused by the decomposition of saccharine in the presence of strong mineral acids. A better method to obtain saccharine in larger quantities and of higher purity consists in the employment of plumbic dioxide as an oxidizing agent. The plumbic dioxide can be easily obtained from either sulphate of lead or basic chloride of lead by oxydation with hypochlorite and carbonate of sodium. Having prepared in such a way the plumbic dioxide it is washed and then ready for use. Toluene sulphamid and plumbic dioxide are mixed together with sufficient water and heated by steam until the toluene sulphamid has become completely converted into the lead salt of saccharine while the plumbic dioxide is converted into litharge. The solution containing the lead-salt is treated with hydrogen sulphide in order to precipitate the lead as lead sulphide. The hot saturated solution of saccharine is then separated from the precipitate by means of any convenient filter and yields on cooling crystals of pure saccharine. The mother-liquors resulting from the crystallization are used for the oxidation of toluene sulphamid in place of water to save the expense of evaporation, which in the case of the
44 permanganate process would be comparatively large. The lead sulphide and the litharge are made use of in the preparation of fresh quantities of plumbic dioxide. The former is roasted for this purpose in a furnace and converted into sulphate of lead. The latter, however, is treated with chloride of sodium and converted into basic chloride of lead, which latter yields by oxidation with hypochlorite and carbonate of sodium plumbic dioxide, as hereinbefore described.

From the pure saccharine different salts can be prepared by treatment with the corresponding carbonates in an aqueous solution. Saccharine may also be prepared by oxidizing the two toluene-sulphonic acids or their salts with any of the above-named oxidizing

agents into sulphobenzoates, and further treatment with phosphor-pentachloride and caustic or carbonate of ammonia. The final result of such a treatment will be the formation of an insoluble diamid of sulphobenzoic acid and the ammonium salt of saccharine.

The way in which saccharine in its pure state is obtained from its salts has already been described.

The phosphoroxychloride, resulting from the fifth operation, contains nearly three-fifths part of the total chlorine and all the phosphorus of the phosphor-pentachloride, and is used in the manufacture of phosphor-pentachloride from phosphorus and bleaching powder (hypochloride of calcium) by conversion with water into hydrochloric and phosphoric acids. The hydrochloric and phosphoric acids are used for generating chlorine from bleaching-powder. The phosphate of lime and calcium chloride left in the generator may be separated and the phosphate of lime used as a fertilizer. In other respects the old and well-known process of making phosphor-pentachloride from phosphorus is not altered. The solid toluene-sulphochloride, amounting, by weight, to about two-thirds of the total bulk of the toluene sulphochlorides, is mixed with carbon and moistened with water and converted under pressure in a retort into hydrochloric and toluene-sulphonic acids. On passing superheated steam over this mass toluene and hydrochloric and sulphurous acids are obtained. Toluene is used in operation 1, while hydrochloric and sulphurous acids are profitably employed in the separation of saccharine from its salts when the permanganate process of oxidation is used.

The final product of the process described is the new saccharine compound benzoic sulphinide, the chemical formula of which is $C_7H_5O_3SN$, and which has the characteristic properties described in the publications hereinbefore set forth.

Having thus described my invention, I claim as new and desire to secure by letters patent—

1. The process of making a new sweet compound from toluene and other derivatives of coal-tar, which consists of the following successive steps: first, converting toluene and the substitution products of benzine and its homologues into toluene-monosulphonic acids by fuming or concentrated sulphuric acid; second, converting the toluene-monosulphonic acids into calcium toluene-monosulphonates by chalk or carbonate of lime; third, converting the calcium toluene monosulphonates by sodium carbonate or bicarbonate or any carbonate of the alkalies into sodium toluene-monosulphonate or any toluene monosulphonate of the alkalies; fourth, evaporating the sodium toluene-monosulphonate in open or vacuum pans, and cooling and drying the same; fifth, converting the dry product into the two isomeric toluene-monosulphochlorides and phosphoroxychloride by the action of phosphor-pentachloride and separation of the resulting solid toluene-monosulphochloride in a centrifugal machine; sixth, converting the liquid toluene-monosulphochloride into the corresponding amid by treatment with caustic or carbonate of ammonia; seventh, treating the amid thus obtained with certain oxidizing agents in an alkaline solution to obtain the

salts of the same; and, eighth, separating the pure saccharine compound from its salts by acids, acid salts, and hydrogen sulphide, substantially as described.

2. The process of making a new sweet compound from toluene and other derivatives of coal-tar, which consists in converting toluene into toluene-sulphonic acid, oxidizing said acid or its salts into sulphobenzoic acid or its salts, then evaporating the latter and treating it with phosphor-pentachloride and caustic or carbonate of ammonia, and finally separating the pure saccharine from the ammonium salt thus obtained, substantially as set forth.

3. The regeneration of toluene and the generation at the same time of hydrochloric and sulphurous acids from the solid toluene-monosulphochloride by the action of carbon, water, and superheated steam under pressure, substantially as described.

4. The generation of chlorine for the preparation of phosphor-pentachloride from phosphoroxychloride, bleaching powder (hypochlorite of lime) and water, respectively, hydrochloric and phosphoric acids, or one of them, substantially as set forth.

5. The saccharine compound, benzoic sulphinide, made by the process herein described.

6. The new saccharine compound, toluene-monosulphamid having the characteristics described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CONSTANTIN FAHLBERG.

Witnesses:
G. DITTMER.
B. ROI.

45 EXHIBIT B:

UNITED STATES PATENT OFFICE.

CONSTANTIN FAHLBERG, of New York, N. Y.

Saccharine Compound.

Specification forming part of Letters Patent No. 326,281, dated September 15, 1885. Application filed June 26, 1885. (No specimens.)

To all whom it may concern:

Be it known that I, Constantin Fahlberg, of the city, county, and State of New York, have invented certain new and useful improvements in saccharine compounds, of which the following is a specification.

This invention relates to an improved saccharine compound, in the production of which the saccharine compound is employed that has been patented to me under date of June 2, 1885, No. 319,082, and to which the chemical name of "benzoic sulfinide" has been given; and the invention consists of a saccharine compound

composed of a mixture of grape or starch sugar and benzoic sulfinide, to which I have given the name of "dextro-saccharine."

My invention has for its object to bring a proportionately large quantity of grape or starch sugar together with a proportionately small quantity of benzoic sulfinide, whereby the latter imparts to the whole mass about the sweetening property of cane sugar or saccharose, so as to be successfully used in the preparation of candies, preserves, cordials, &c.

In carrying out my invention the liquors resulting from the conversion of starch into grape or starch sugar, commonly known as "glucose," are mixed either in the vacuum-pan or previous to the evaporation therein in the proportion of from one to two pounds (more or less) of benzoic sulfinide to one ton of anhydrous sugar in solution until the mass becomes clear and homogeneous. The liquor is then evaporated down to any desired consistency and run either into molds and allowed to solidify, so as to form solid dextro-saccharine, or it is kept in a liquid state, so as to form liquid dextro-saccharine, or crystallized by the "Behr" process as anhydrous dextro-saccharine. All of these products possess the combined properties of grape or starch sugar and benzoic sulfinide, and may be used as substitutes for cane-sugar, as, notwithstanding the comparatively high price of benzoic sulfinide, dextro-saccharine can be furnished at a lower price than cane-sugar, owing to the low price of grape-sugar and the small quantity of benzoic sulfinide required for imparting to the same the sweetness of cane-sugar or saccharose.

Having thus described my invention, I claim as new and desire to secure by letters patent—

A saccharine compound consisting of a mixture of starch or grape sugar and benzoic sulfinide, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

CONSTANTIN FAHLBERG.

Witnesses:

PAUL GOEPEL.
SIDNEY MANN.

46 EXHIBIT C.

UNITED STATES PATENT OFFICE.

CONSTANTIN FAHLBERG, of New York, N. Y., assignor of one-half to Adolph List, of Leipsic, Germany.

Manufacture of Saccharine Compounds.

Specification forming part of Reissued Letters Patent No. 10667, dated December 1, 1885. Original No. 319,082, dated June 2, 1885. Application for reissue filed July 25, 1885. Serial No. 172,697. Patented in Belgium August 16, 1884, No. 66048, and in France August 16, 1884, No. 163,797.

To all whom it may concern:

Be it known that I, Constantin Fahlberg, of the city, county, and State of New York, have invented a new and useful compound called saccharine, and process of manufacturing the same, as hereinafter fully described.

My invention relates to the manufacture of a saccharine compound from toluene and other derivatives of coal-tar, which compound contains the elements of carbon, hydrogen, oxygen, sulphur, and nitrogen, and possesses a similar sweet taste as saccharose or cane-sugar. It may be used for many purposes where sugar would be too costly—for instance, in sweetening glucose, grape or starch sugar, and for other purposes where cane-sugar is used for sweetening and preserving purposes.

The invention is based upon the original researches published by myself in the American Chemical Journal, volume 1, Nos. 2 and 3, June, 1879, pages 170 to 175, and jointly by myself and Ira Remsen, in the same journal, volume 1, No. 6, pages 426 to 438, in which a saccharine compound was first described, to which the name of "benzoic sulphinide" was given.

The object of this invention is to provide a process by which said saccharine compound can be manufactured on a large scale, and cheap enough to be used in the arts.

The special characteristics of the compound are its sweetness and antiseptic properties.

The high antiseptic properties of my improved saccharine compound will recommend it for many purposes in the arts and medicine. Owing to the fact that it cannot be classed under the heading of nourishments, like sugar and similar carbon hydrates, it may be used for many medical purposes in which cane-sugar is excluded from the diet, as in the case of "diabetes mellitus," and other diseases.

My improved compound does not dissolve easily in cold water. It is more soluble in warm or hot water, and can be easily obtained from its aqueous solution in crystalline form. Alcohol and ether dissolve it readily. It crystallizes in thick short prisms, in all

probability belonging to the monoclinic system. The crystals, however, are small and not well formed. It fuses at about 200° centigrade under partial decomposition. Saccharine possesses a marked sweet taste, being much sweeter than cane-sugar and sweeter than grape or starch sugar. A diluted solution of the compound tastes like a saturated solution of cane-sugar.

In an aqueous solution my improved saccharine compound forms readily salt-like compounds with the alkalies, alkaline earths or metals, similar to cane-sugar. These salts possess the same pleasant sweet taste as the compound itself. All salts of the compound crystallize badly, those of the alkalies yielding on evaporation a sirup-like mass, which is unable to crystallize even after long standing.

The saccharine compound forms, under certain conditions, with the residues of the hydrocarbons, as methyl, ethyl, propyl, &c., compounds which are termed "esters," possessing the same sweet properties as the primary compound.

The saccharine compound being a derivative of benzoic acid does not ferment like grape-sugar and other carbon hydrates.

Having described so far the properties and advantages of my new sweet compound, to which I have given the name "saccharine," I shall now proceed to describe the process of its preparation.

Operation 1: Saccharine is prepared from coal-tar and similar products, in particular from such products containing abundantly benzine, toluene, xylene, &c. Although toluene generally is used for economical reasons, other substitution products of benzine and the like, which yield on oxidation, or which contain without previous oxidation benzoic acid, may be used. Toluene is first treated with fuming sulphuric acid in the cold, or with concentrated sulphuric acid, at a temperature of 220° Fahrenheit, and above, in leaden vessels until it is dissolved, respectively converted into the two isomeric toluene-monosulphonic acids. It has been found, however, that strong concentrated sulphuric acid, or a mixture of hydrated sulphuric acid and anhydrous sulphuric acid is better adapted for this purpose, inasmuch as the yield of saccharine was larger than when fuming sulphuric acid was used.

47 Operation 2: As soon as the last trace of toluene has become converted into the two toluene-monosulphonic acids the contents of the vessel are allowed to run into wooden tanks, neutralized with chalk or carbonate of lime, and filtered through a filter-press. The last traces of calcium toluene-sulphonate which persistently adhere to the calcium sulphate in the filter-press are separated from it by washing it with hot water. The wash-liquor is worked, together with the first liquor, in the next operation.

Operation 3: All liquors of the previous operation are converted from the calcium salt into the salts of the alkalies by means of any of the known carbonates of the alkalies—for instance, into the corresponding sodium toluene-monosulphonates—by using a carbonate or bicarbonate of sodium. The carbonate of lime resulting from this operation can be filtered off by a filter-press, and used again in the second operation in place of ordinary chalk. This quantity of

carbonate of lime would be sufficient for a continuous preparation of calcium toluene-sulphonate had it not been for an excess of sulphuric acid required in operation 1, which is to be neutralized with fresh quantities of chalk.

Operation 4: The resulting solution of the sodium salt is evaporated in open or vacuum pans until on cooling it becomes hard. The contents of the pan are then solidified by running them into iron or wooden molds. The lumps are chipped or broken by hand or machines and placed in a drying-room. To be sure that all the water from the sodium salt is removed, it is dried afterward by steam in convenient drying apparatus.

Operation 5: As soon as the sodium salts are found to be perfectly dry they are treated in an apparatus especially constructed for this purpose, with phosphor-pentachloride (most conveniently made by a method hereinafter described) in proportions to effect a complete transformation. The products formed by this operation will be two isomeric toluene-monosulphochlorides and phosphoroxychloride. The latter is removed by distillation, collected and used in the preparation of phosphor-pentachloride, while the former, consisting of a solid and a liquid toluene-sulphochloride, are separated in a centrifugal machine or other equivalent apparatus. A frequent washing with cold water in the centrifugal machine is essential to effect a complete separation of the two toluene-sulphochlorides, inasmuch as the saccharine is only obtained from the liquid portion. The solid sulphochloride remaining in the centrifugal machine is removed and converted by a method given below into toluene, hydrochloric, and sulphurous acids. The former is used for the preparation of fresh quantities of toluene-sulphonic acids, the latter for the manufacture of phosphor-pentachlorides, or for the separation of saccharine from its salts. The liquid sulphochloride is cooled by ice to separate the last traces of the solid portion, placed again in a centrifugal machine, and finally converted into the amid.

Operation 6: The liquid toluene-sulphochloride is converted, either by caustic or carbonate of ammonia, preferably by the latter, into toluene sulphamid. For this purpose the liquid sulphochloride and the solid carbonate of ammonia are mixed together in proper proportions and exposed to heat, so as to effect the transformation, during which carbonic-acid gas is given off. The remaining mass contains the amid with a certain quantity of ammonium chloride.

Operation 7: The amid, after being separated by a centrifugal machine, is oxidized by means of any of the known oxidizing agents in an alkaline solution, and yields a salt of saccharine, which corresponds with regard to its base to the base of the oxidizing agent. Such oxidizing agents are numerous; but preferably permanganates and plumbic dioxide are used.

In making use of the permanganates the result of the oxidation will be a salt of saccharine, hydrated manganese dioxide, and a free alkali or a carbonate of an alkali. The insoluble hydrated manganese dioxide can be easily separated from the alkaline solution containing the salt of saccharine by means of a filter or any other

convenient method, and converted by any of the known methods into permanganates and used for subsequent oxidation of toluene-sulphamid. The slightly alkaline solution containing the salt of saccharine can be neutralized by an acid, and finally evaporated to any desired consistency. The slightly impure product will be found to possess a pleasant sweetness. In order to prepare the pure saccharine therefrom, the concentrated solution of the salt is treated with either hydrochloric or sulphuric acid and the precipitate dissolved and crystallized. It yields in this way a colorless and finely-crystallized product of characteristic sweetness. The precipitation with strong acids is connected with great loss, caused by the decomposition of saccharine in the presence of strong mineral acids. A better method to obtain saccharine in larger quantities and of higher purity consists in the employment of plumbic dioxide as an oxidizing agent. The plumbic dioxide can be easily obtained from either sulphate of lead or basic chloride of lead by oxidation with hypochlorite and carbonate of sodium. Having prepared in such a way the plumbic dioxide, it is washed and then ready for use. Toluene-sulphamid and plumbic dioxide are mixed together with sufficient water and heated by steam until the toluene-sulphamid has become completely converted into the lead-salt of saccharine, while the plumbic dioxide is converted into litharge. The solution containing the lead salt is treated with hydrogen sulphide, in order to precipitate the lead as lead sulphide. The hot saturated solution of saccharine is then separated from the precipitate by means of any convenient filter, and yields on cooling crystals of pure saccharine.

48 The mother liquors resulting from the crystallization are used for the oxidation of toluene-sulphamid in place of water to save the expense of evaporation, which in the case of the permanganate process would be comparatively large. The lead sulphide and the litharge are made use of in the preparation of fresh quantities of plumbic dioxide. The former is roasted for this purpose in a furnace and converted into sulphate of lead. The latter, however, is treated with chloride of sodium and converted into basic chloride of lead, which latter yields, by oxidation with hypochlorite and carbonate of sodium, plumbic dioxide, as hereinbefore described.

From the pure saccharine different salts can be prepared by treatment with the corresponding carbonates in an aqueous solution. Saccharine may also be prepared by oxidizing the two toluene-sulphonic acids or their salts with any of the above-named oxidizing agents into sulphobenzoates, and further treatment with phosphor-pentachloride and caustic or carbonate of ammonia. The final result of such a treatment will be the formation of an insoluble diamid of sulphobenzoic acid and the ammonium salt of saccharine.

The way in which saccharine in its pure state is obtained from its salts has already been described.

The phosphoroxychloride, resulting from the fifth operation, contains nearly three-fifths part of the total chlorine and all the phosphorus of the phosphor-pentachloride, and is used in the manufact-

ure of phosphor-pentachloride from phosphorus and bleaching-powder (hypochlorite of calcium) by conversion with water into hydrochloric and phosphoric acids. The hydrochloric and phosphoric acids are used for generating chlorine from bleaching-powder. The phosphate of lime and calcium chloride left in the generator may be separated and the phosphate of lime used as a fertilizer. In other respects the old and well-known process of making phosphor-pentachloride from phosphorus is not altered. The solid toluene-sulphochloride, amounting, by weight, to about two-thirds of the total bulk of the toluene-sulphochlorides, is mixed with carbon and moistened with water and converted under pressure in a retort into hydrochloric and toluene-sulphonic acids. On passing superheated steam over this mass toluene and hydrochloric and sulphurous acids are obtained. Toluene is used in operation 1, while hydrochloric and sulphurous acids are profitably employed in the separation of saccharine from its salts when the permanganate process of oxidation is used.

The final product of the process described is the new saccharine compound benzoic sulphinide, the chemical formula of which is $C_7H_5O_3SN$, and which has the characteristic properties described in the publications hereinbefore set forth.

Having thus described my invention, I claim as new and desire to secure by letters patent—

1. The process of making a new sweet compound from toluene and other derivatives of coal-tar, which consists of the following successive steps: first, converting toluene and the substitution products of benzine and its homologues into toluene-monosulphonic acids by fuming or concentrated sulphuric acid; second, converting the toluene-monosulphonic acids into calcium toluene-monosulphonates by chalk or carbonate of lime; third, converting the calcium toluene-monosulphonates by sodium carbonate or bicarbonate, or any other carbonate of the alkalies, into sodium toluene-monosulphonate or any toluene-monosulphonate of the alkalies; fourth, evaporating the sodium toluene-monosulphonate in open or vacuum pans and cooling and drying the same; fifth, converting the dry product into the two isomeric toluene-monosulphochlorides and phosphoroxychloride by the action of phosphor-pentachloride and separation of the resulting solid toluene-monosulphochloride in a centrifugal machine; sixth, converting the liquid toluene-monosulphochloride into the corresponding amid by treatment with caustic or carbonate of ammonia; seventh, treating the amid thus obtained with certain oxidizing agents in an alkaline solution to obtain the salts of the same; and, eighth, separating the pure saccharine compound from its salts by acids, acid salts, and hydrogen sulphide, substantially as described.

2. The process of making a new sweet compound from toluene and other derivatives of coal-tar, which consists in converting toluene into toluene-sulphonic acid, oxidizing said acid or its salts into sulphobenzoic acid or its salts, then evaporating the latter and treating it with phosphor-pentachloride and caustic or carbonate of am-

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Exhibit D

Page 49.

Henrietta Louise Lutz et al., etc.,
vs.
Daniel Magone, Coll.; etc.

No. 336.

monia, and finally separating the pure saccharine from the ammonium salt thus obtained, substantially as set forth.

3. The regeneration of toluene and the generation at the same time of hydrochloric and sulphurous acids from the solid toluene-monosulphochloride by the action of carbon, water, and superheated steam under pressure, substantially as described.

4. The generation of chlorine for the preparation of phosphor-pentachloride from phosphoroxychloride, bleaching-powder, (hypochlorite of lime,) and water, respectively, hydrochloric and phosphoric acids, or one of them, substantially as set forth.

5. The saccharine compound, benzoic sulphinide, substantially as described.

6. The saccharine compound, benzoic sulphinide, made by the process herein described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CONSTANTIN FAHLBERG.

Witnesses:

MARTIN PETRY.
SIDNEY MANN.

(Here follows label marked p. 49.)

49 *Saccharine.*

Patented.

300 times sweeter than sugar.

.....

LUTZ & MOVIUS,

15 *Warren Street, New York,*

Sole Agents for the U. S. A.

50 [Endorsed:] 12904. U. S. circuit court, southern district of N. Y. Henrietta Louise Lutz and Horace E. Deming, as administrators, &c., of Louis Lutz, deceased, *vs.* Daniel Magone. Bill of exceptions. (Copy.) Comstock & Brown, plaintiffs' attorneys, 80 Broadway, N. Y. To Edward Mitchell, Esq., attorney for defendant. U. S. circuit court. Filed September 24, 1890. John A. Shields, clerk.

51 Circuit Court of the United States of America for the Southern District of New York, in the Second Circuit.

HENRIETTA LOUISE LUTZ *et al.*
vs.
DANIEL MAGONE, Collector, &c. } Bond for Damages and Costs.

Know all men by these presents that we, Joseph Movius and Augustus Movius, are held and firmly bound unto the above-named Daniel Magone in the sum of two hundred — fifty dollars, to be paid to the said Daniel Magone; for the payment of which, well and truly to be made, we bind ourselves and each of us, our and each of our heirs, executors, and administrators, jointly and severally, firmly by these presents.

Sealed with our seals and dated the 7th day of October, in the year of our Lord one thousand eight hundred and ninety.

Whereas the above-named Henrietta Louise Lutz *et als.* have prosecuted their appeal to the Supreme Court of the United States to reverse the judgment rendered in the above-entitled suit by the judge of the circuit court of the United States for the southern district of New York:

Now, therefore, the condition of this obligation is such that if the above-named Henrietta Louise Lutz *et al.* shall prosecute their appeal to effect and answer all damages and costs if they fail to make said appeal good, then this obligation shall be void; otherwise the same shall be and remain in full force and virtue.

JOSEPH MOVIUS. [L. S.]
AUGUST MOVIUS. [L. S.]

Sealed and delivered and taken and acknowledged this 7th day of October, 1890, before me—

A. W. NICOLL,
[L. S.] *Notary Public, New York County.*

52 UNITED STATES OF AMERICA, } ss:
Southern District of New York,

Joseph Movius and August Movius, being duly sworn, do depose and say and each one for himself says that he is worth the sum of five hundred dollars over and above all his just debts and liabilities.

J. MOVIUS.
AUGUST MOVIUS.

Sworn to this seventh day of October, A. D. 1890, before me—

A. W. NICOLL,
[L. S.] *Notary Public, New York County.*

[Endorsed:] 12904. U. S. circuit court, southern district of New York. Henrietta Louise Lutz *et al. vs.* Daniel Magone. Bond for costs on appeal. The within bond is hereby approved as to form, amount, and sufficiency of the sureties. N. Y., Oct. 8, 1890. E. Henry Lacombe. U. S. circuit court. Filed Oct. 8, 1890. John A. Shields, clerk.

53 Supreme Court of the United States.

HENRIETTA LOUISE LUTZ *et al.*, Plaintiffs in Error,
vs.
DANIEL MAGONE, Defendant in Error.
} Assignment of Errors.

Afterwards, to wit, on the fourth Monday of October, in the same term, before the justices of the said court, at the Capitol in Washington, come the said plaintiffs in error, by Comstock & Brown, their attorneys, and say that in the record and proceedings aforesaid there is manifest error in this, to wit, that by the record aforesaid it appears that the judgment aforesaid, in form aforesaid given, was given for the said defendant in error against the said plaintiffs in error, whereas by the law of the land the said judgment ought to have been given for the said plaintiffs against the said defendant.

And the said plaintiffs pray that the judgment aforesaid for the error aforesaid and other errors in the record and proceedings aforesaid may be reversed, annulled, and altogether held for nothing, and that (they) the said plaintiffs may be restored to all things which they *has* have lost by occasion of said judgment, &c.

COMSTOCK & BROWN,
Attorneys for Plaintiffs.

54 [Endorsed:] N. S. 12904. United States Supreme Court. Henrietta Louise Lutz *et al.*, plaintiffs in error, *vs.* D. Magone, defendant in error. Assignment of error. Comstock & Brown, attorney- for plaintiffs in error. Due service of a copy of the within assignment of error is hereby admitted this fifteenth day of October, 1890. Edward Mitchell, attorney for defendant in error. To Edward Mitchell, Esq., attorney for defendant in error. U. S. circuit court. Filed Oct. 15, 1890. John A. Shields, clerk.

55 Supreme Court of the United States.

HENRIETTA LOUISE LUTZ, HORACE E. DEMING, Administrators of the Goods, Chattel-, and Credit- of Louis Lutz, Deceased, Plaintiffs in Error,
vs.
DANIEL MAGONE, Defendant in Error.
} Joinder in Error.

And afterwards, to wit, on the third Monday of the October term in said term, the said defendant in error, by Edward Mitchell, U. S. att'y, his attorney, comes here into court and says that there is no error either in the record or proceedings aforesaid or in the giving of the judgment aforesaid.

And he prays that the said supreme court, before the justices thereof, now here, may proceed to examine as well the record and proceedings aforesaid as the matters aforesaid above assigned for

error, and that the judgment aforesaid in form aforesaid given may be in all things affirmed, &c.

EDWARD MITCHELL,
U. S. Att'y and Attorney for Defendant in Error.

56 [Endorsed:] 12904. United States Supreme Court. Henrietta Louise Lutz *et al.*, &c., plaintiffs in error, *vs.* Daniel Magone, defendant in error. Joinder in error. Edward Mitchell, U. S. att'y and attorney for defendant in error. Due service of a copy of the within joinder in error is hereby admitted this 16th day of Oct., 1890. Comstock & Brown, attorneys for plaintiff- in error. To Comstock & Brown, Esq-., attorney- for pl'ff- *plaintiff* in error. U. S. circuit court. Filed Oct. 16, 1890. John A. Shields, clerk.

57 UNITED STATES OF AMERICA, *ss:*

To Daniel Magone, Greeting:

You are hereby cited and admonished to be and appear at a Supreme Court of the United States, to be holden at Washington on the third Monday of October term, eighteen hundred and ninety, pursuant to a writ of error filed in the clerk's office of the circuit court of the United States for the southern district of New York, wherein Henrietta Louise Lutz and Horace E. Deming, administrators of the goods, chattels, and credits of Louis Lutz, deceased, are plaintiffs in error and you are defendant in error, to show cause, if any there be, why the judgment in said writ of error mentioned should not be corrected and speedy justice should not be done to the parties on that behalf.

Dated October 8th, 1890.

E. HENRY LACOMBE.

58 [Endorsed:] E. & A. A. 938. N. S. 12904. U. S. Supreme Court. Henrietta Louise Lutz *et al.*, plaintiffs in error, against D. Magone, defendant in error. Citation. Comstock & Brown, attorneys for plaintiffs in error. Due service of a copy of the within citation is hereby admitted this 15th day of October, 1890. Edward Mitchell, attorney for defendant in error. S. U. S. circuit court. Filed Oct. 15, 1890. John A. Shields, clerk. 25 chr.

Endorsed on cover: Case No. 14,393. S. New York C. C. U. S. No. 336. Henrietta Louise Lutz and Horace E. Deming, administrators of the goods, chattels, and credits of Louis Lutz, deceased, plaintiffs in error, *vs.* Daniel Magone, collector of the port of New York. Filed October 28, 1890.

Office Supreme Court U. S.
FILED,
MAR 26 1894
JAMES H. McKENNEY,
CLERK.

Supreme Court of the United States.

OCTOBER TERM, 1893.

No. 336.

HENRIETTA LOUISE LUTZ and HORACE E. DEMING,
Administrators of the Goods, Chattels and Credits of
Louis Lutz, deceased,
Plaintiffs in Error,

vs.

DANIEL MAGONE, Collector of the Port of New York,
Defendant in Error.

BRIEF FOR THE PLAINTIFFS IN ERROR.

ALBERT COMSTOCK,
Of Counsel.

COMSTOCK & BROWN,
Attorneys for Plaintiffs in Error.

C. G. BURGOYNE, WALKER AND CENTRE STS., NEW YORK.

Supreme Court of the United States.

HENRIETTA LOUISE LUTZ and HORACE E. DEMING, Administrators of the goods, chattels and credits of Louis Lutz, deceased,
Plaintiffs in Error,

vs.

DANIEL MAGONE, Collector of the Port of New York,
Defendant in Error.

October Term, 1893.
No. 336.

BRIEF FOR THE PLAINTIFFS IN ERROR.

Statement.

This is an action arising under the Tariff Act of 1883 (22 Stat. at L., 488–526).

In 1887, Louis Lutz, a merchant at that time doing business under the name or style of Lutz & Movius (but since deceased), imported, at the port of New York, certain merchandise known and described by the name of "saccharine." The defendant in error, as Collector of that port, exacted duty upon the said merchandise at the rate of 25 per cent. *ad valorem* as a chemical compound, under the provision of Schedule A of the act in question (22 Stats. at L., 488), for "All preparations known as essential oils, expressed

oils, distilled oils, rendered oils, alkalis, alkaloids, and all combinations of any of the foregoing, and all chemical compounds and salts, by whatever name known, and not specially enumerated or provided for in this act" (R., p. 10, fol. 22). Against this exaction the importer duly protested, claiming free entry for the merchandise under the provision for "Acids used for medicinal, chemical or manufacturing purposes, not specially enumerated or provided for in this act," which provision is found in the free list (22 Stats. at L., 516) of said act (R., pp. 10, 11, fol. 22).

Subsequently thereto, and prior to the trial of this action, the said Louis Lutz died, the plaintiffs in error were duly appointed administrators of his estate, and an order was duly made whereby the said plaintiffs in error were substituted for him as plaintiffs in this action (R., pp. 7–9, fols. 14–17).

Upon the trial of the action in the Circuit Court, it was proven that the importer had paid to the defendant in error, in order to obtain possession of the merchandise in question, the sum of $1,074.50 as duties thereon (R., p. 15, fol. 31), and had complied in due time with all the statutory prerequisites to maintaining an action for the recovery of the said sum (R., p. 11, fol. 22).

Evidence was adduced on behalf of the plaintiffs in error upon the trial, from professional chemists, that the article known as "saccharine" was in fact an acid (R., p. 11, fol. 23; p. 14, fols. 29, 30), and was used in the manufacture of various commodities such as soda water, liquors, tobacco, medicines etc. (R., p. 13, fols. 26, 27; p. 14, fol. 39), its functions in such commodities being to sweeten them and render them palatable and therefore merchantable (R., p. 13, fol. 28), that it was not a medicine, nor were medicines made out of it (R., p. 13, fol. 27), and that it had no medicinal effect upon the human or animal body (R., p. 14, fol. 30); and that it was an anhydrous acid or an anhydrid, which meant

an acid free from water (R., p. 12, fol. 26; p. 13, fol. 28; p. 15, fols. 30, 31). A standard scientific work on chemical classification, identified by a witness, was also offered as evidence on behalf of the plaintiffs in error, to prove that "saccharine" is an acid, but was excluded by the Court, an exception to such exclusion being taken by and allowed to the plaintiffs in error (R., p. 15, fol. 31).

Evidence was adduced on behalf of the defendant in error to prove that "saccharine" was the subject of several patents, and was always sold in packages on which the fact of its being patented was announced (R., pp. 15–17, fols. 32–34); that it was not regarded as an acid but as an anhydrid by chemists, and that an anhydrid did not mean an anhydrous acid, but a body without hydrogen and not an acid (R., pp. 17, 18, fols. 35–37); that an acid, when the water was removed from it, became an anhydrid, and that there were acids containing no water (R., p. 18, fol. 37). Both sides having rested, a motion for direction of judgment in favor of the defendant in error was made by his counsel, on the grounds that "saccharine" was not an acid used for medicinal, chemical or manufacturing purposes, not specially enumerated or provided for in the tariff act of March 3, 1883, that it was a preparation or composition recommended to the public as a proprietary article within the meaning of that act, and that if not within that provision it was dutiable as a chemical compound under paragraph 92 of the said act, as assessed by the defendant in error. The Court granted this motion upon the ground that the use of saccharine in the manufacture of commodities requiring to be sweetened, and in which it subserved only the purpose of sweetening, was not a use as an acid for manufacturing purposes, and a verdict was directed accordingly (41 Fed. Rep., 128). To this ruling and direction exception was duly taken on behalf of the plaintiffs in error, and was duly allowed by the Court. To review the judgment given in accordance with such direction and verdict, the plaintiffs in error bring this writ of error.

Assignment of Errors.

The plaintiffs in error assign as errors :

1. The ruling of the Court below, that when " saccharine " is mechanically combined with other substances in the course of their manufacture, for the sole purpose of sweetening, it is not thereby used as an acid in manufacture.

2. The ruling that the meaning of the paragraph for acids in the free list is that acids, which are used for the reason that by their chemical combination with other articles they produce substances medicinal, substances chemical, or substances which are to be regarded as the fruits of manufacture, are to be admitted free.

3. The ruling that this article (" saccharine ") when used for manufacturing purposes, is not used as an acid at all.

4. The ruling that " saccharine," when used as already set forth, cannot fairly be maintained to be an acid used for manufacturing purposes.

5. The granting of the motion of counsel for the defendant in error for direction of a verdict in his favor and the direction of verdict in accordance therewith.

6. The judgment entered in favor of the defendant in error on the verdict thus directed.

POINTS.

I.

Only the applicability of the free-list provision is really involved in this argument.

The paragraph under which duty was exacted is so wide and inclusive as scarcely to be an enumeration at all. It has been described as the *omnium gatherum* of the tariff act, and a less specific, denominative, or even accurately descriptive provision, it would be hard to find. So true is this, that the Federal Courts were long in doubt as to the proper order of precedence between it and the similitude clause for non-enumerated articles, as is shown in the cases of Biddle vs. Hartranft, 29 Fed. Rep., 90, and Lloyd vs. McWilliams, 31 Fed. Rep., 261. And this Court, in setting that question at rest, said nothing to imply that the paragraph was entitled to be ranked with such specific provisions as that under which the plaintiffs in error have claimed.

Mason vs. Robertson, 139 U. S., 624.

The question between the two paragraphs is well within the general rule that specific provisions must take precedence of general ones.

Homer vs. Collector, 1 Wall., 688.
Seeberger vs. Cahn, 137 U. S., 95.
American Net and Twine Co. vs. Worthington, 141 U. S., 468.

If "saccharine" be covered by the free-list provision for acids, there could be no possible conflict between that provision and the one employed by the Collector. It is common knowledge that every acid is a chemical compound, and that many chemical compounds are not acids.

The paragraph in Schedule A. (22 Stat. at L., 494) which provides for the exaction of 50 per cent. duty on

proprietary preparations, is rendered inapplicable to the merchandise here in issue, not by its want of specificness, but by its entire irrelevancy to any such article as "saccharine." Here is an article not in the slightest degree medicinal either in character, effect or reputation, but merely a means for producing sweetness in manufactured edibles and the like—an article not prepared according to any private or secret formula, but according to one of the utmost publicity—an article not recommended to the public as a remedy or specific for disease, but distinctly offered and sold on its merits as a sweetening agent. Thus it is signally at variance with the requisites for classification under the paragraph in question, and it is not to be wondered at that the defendant in error did not even think of exacting the duty there provided upon it, nor that the Court below rejected the suggestion of counsel, that solely because "saccharine" is patented, it should be classed as a proprietary preparation. The conclusion sought in that motion would have made such articles as "Hecker's patent prepared buckwheat," "Platt's chlorides for house cleaning," "Twin Brothers' yeast cakes," and "Bixby's blacking" dutiable as proprietary preparations;—a result most grotesque in its relation, or want of relation, to the evident intent of Congress in enacting the paragraph in question.

We come, then, to consider the provision in the free list.

II.

The ruling of the Court below is open to two interpretations as to why it held saccharine not to be an acid used for manufacturing purposes.

Did the Court consider that the article was not *an acid* such as the free list referred to, or that *its use* was not such as the free list referred to? The ruling may be studied in vain to discover which of these positions the Court meant to take. Upon either horn of the dilemma, however, its position is equally untenable.

III.

There was at least reasonable proof that "saccharine" was an acid.

It is scarcely conceivable that the Court took, as the common and received meaning of "acid," that old and primitive significance which refers to a sour or acidulous flavor. To be sure, "saccharine" is no such acid as that, for its chief characteristic is intense sweetness, in which it nearly three hundred times exceeds sugar. But not only was no suggestion of such a view given by the Court, but the view would, we submit, be utterly unwarranted. Even the standard dictionaries give no such definition, but are as follows:

Worcester: "A substance, usually sour and sharp to the taste, that changes vegetable blue colors to red, and combining with an earth, an alkali, or a metallic oxide, forms a salt."

Webster: "An electro-negative substance, having the properties of combining with alkalies and alkaline oxyds, of reddening most blue vegetable colors, and usually with a strong, sharp taste."

In seeking the definition of the word "acid," however, it seems evident that recourse should be had to chemical authorities, for the word is distinctly a chemical word. And of chemical testimony, a clear preponderance was in favor of the contention of the plaintiffs in error. Two expert professional chemists, graduated from schools of science, testified that "saccharine" was an acid, in an anhydrous or waterless form. They gave particulars to support their testimony, which was clear, consistent, and unshaken on cross-examination. Only one witness undertook to contradict these two, and he was not a graduate in chemistry, and he also badly contradicted himself. A reference to his testimony (R., pp. 17, 18, fols. 36, 37), shows that he swore that "saccharine" was an anhydrid; that an anhydrid was not an acid, but a body devoid of displaceable hydrogen, and not merely devoid of water; yet an acid would become an anhydrid, if the water were removed from it, and that he knew of acids which contained no water. Such evidence is grossly inconsistent, and implies an incompetent witness. The standard works referred to in the testimony, both technical and semi-technical (R., p. 15, fol. 31; p. 17, fol. 36), classed "saccharine" as an acid. If, therefore, the Court below meant to hold that "saccharine" was not an acid, its ruling was erroneous and should be reversed.

IV.

"Saccharine" is, without dispute, shown to be used for manufacturing purposes.

Upon this point there was no testimony offered on behalf of the defendant in error. The proofs showed that "saccharine" was employed as an ingredient in the manufacture of preserves, soda and mineral waters, liquors and wines, chewing tobacco, foods, etc., the purpose which it subserved being to impart sweetness to these products. The Court below was, therefore, entirely unwarranted in ruling, if it intended to rule, that "saccharine," while an acid, was not used for manufacturing purposes. But the language employed is open to another construction, namely, that an acid used for manufacturing purposes, was nevertheless not entitled to free entry under the Act of 1883, unless such use involved a chemical combination with other articles. This, we believe, was the true difficulty in the mind of the Circuit Court; indeed this position was clearly taken in the course of the ruling, and we shall therefore proceed to consider it.

V.

Such a condition imported into the statute was legislation on the part of the Court.

The provision under consideration is not ambiguous; it requires for its proper application nothing save determination of the facts: is an article an acid, and for what purposes is it used? The words "manu-

facturing purposes" are surely not obscure enough in meaning to require any elaborate judicial construction, and the expression "used for" is very ordinary English which every man understands. There was therefore no warrant whatever for interpretation in this case, for it is well settled that courts are not to look behind language of obvious meaning, to find, and to give effect to, some probable desire of the legislators, not expressed in the law as enacted.

Ruggles vs. Illinois, 108 U. S., 527.
Thornley vs. United States, 113 U. S., 310.
United States vs. Nelson, 29 Fed. Rep., 202.
Hewitt vs. West. Union Tel. Co., 4 Mackey, 424.
Johnson vs. Hudson Riv. R. R. Co., 49 N. Y., 455.
Benton vs. Wickwire, 54 N. Y., 226.

VI.

In the present case, not only was interpretation employed without reason, but an intrinsically unreasonable interpretation was applied.

For if Congress meant, by "manufacturing purposes," uses involving a chemical combination of the acids with other articles, for what remaining object did it refer separately to "chemical purposes?" The class of uses to which the Court by its ruling confined the term "manufacturing," *are chemical* uses pure and simple. And in its mention of the three sorts of substances to be produced from, or with, acids, which it thought Congress had had reference to; "substances medicinal, substances chemical, and substances which are re-

garded as the fruits of manufacture," the Court made a proposition entirely untenable. It need scarcely be pointed out—surely it need not be argued—that substances medicinal and substances chemical are generally the fruits of manufacture, and regarded as such. Indeed, it seems to us perfectly evident that Congress has provided—and intentionally—in this free-list paragraph, for just such uses as those of "saccharine." The paragraph provides free entry for acids used in any one or more of several ways; three classes of uses are consecutively enumerated. "Acids used for medicinal purposes" surely includes all acids which find their way into the list of curatives, whether employed simply and in their crude form or as elements in a compound. Salicylic acid is largely and beneficently employed by itself, and so are many others, while acids enter largely into a variety of compounded medicines. The next enumeration is broader and admits free all acids used in making chemical compounds. It undoubtedly overlaps, to some extent, the provision as to medicinal uses, since many chemical compounds of acids are medicines. But it is not conterminous with the latter, for, as pointed out, medicines are, sometimes, simply acids, while chemical compounds from acids are often non-medicinal. And the provision as to chemical uses is broader yet, for it clearly covers acids used as solvents or for the disintegration of pre-existing compounds. This would be distinctly a chemical use, and is largely dwelt upon in the technical books. The third class of uses is the broadest of all, for it includes uses neither medicinal in their results nor chemical in their nature. It extends the benefit of free entry to all acids employed for manufacturing purposes. Again, partly overlying the field of the two previous enumerations, it again leaves a wide margin in this respect, while, at the same time, extending to and including a large area covered by neither of them. For while all the compounds, both medicinal and merely chemical, may perhaps be made by manufact-

uring processes, the medicinal and chemical uses of the crude acids do not necessarily involve manufacture. And " manufacturing purposes " does not in any way imply medicinal or chemical results. Probably the majority of the manufactures of acids are chemical compounds, but numerous ones of them are not, as for instance, lemon sugar from citric and tartaric acid and sugar, aromatic vinegar from certain vegetable ingredients combined with acetic acid, sweet cider from pure cider and salicylic acid, and chewing tobacco and soda-water syrups from " saccharine " (or orthosulphamin-benzoic acid) with leaf tobacco and with other materials. Thus we have here a provision which might fairly be paraphrased—*not construed*—to read "Acids used in medicine, in chemistry, or in manufactures." This is scarcely a paraphrase indeed, but a practically literal reading of the paragraph. That its language is meant in that sense, is, it seems to us, self-evident.

VII.

What, then, are " manufacturing purposes," in the sense of this free list provision?

The Court below, stating the chief use proven for " saccharine," said: " That may be a manufacturing purpose," but proceeded to qualify and construe, to the effect that it did not bring " saccharine " within the language of the free list. If such a metaphysical turn must be given to the words of the statute as to define what employment or function in the production of manufactured goods is, and what is not, sufficient to meet the sense of the law, we think it is still clear that the uses of " saccharine " are on the right side

of the line. There can scarcely be any question, we think, but that preserves, wines, soda-water syrups, beer, etc., are manufactures and the results of manufacturing processes. Then surely every ingredient which is incorporated into these products when they are in course of construction, is in the fullest sense used in manufacturing them, whatever reason may dictate its employment. Are we to stand on so absurd a proposition as that only wool is used for the purpose of manufacturing cassimeres, and not the dyestuffs which give them their color? Or that the only ingredients of toilet soap which are used for the purpose of manufacturing that article are fats and alkalies, to the exclusion of the perfumes which distinguish it from laundry soap? And shall it be said that in confectionery, where sweetness is the preponderating object of the manufacture, sugar is used in its manufacture, while in beer, where other flavors disguise the sweetness, "saccharine" is not used for a manufacturing purpose? Illustrations could be multiplied, but the foregoing are sufficient to point the absurdity of any such construction. The questions set forth on page 13 of the record could as aptly have been asked concerning any of the subsidiary ingredients last named, as of "saccharine," and the answers, if truthful, must needs have shown a parallel state of facts as to those and this. Leaving this morass-like region of sophistical reasoning, and, standing upon firm and tenable ground, we must surely conclude that every material which enters into a manufactured product to give to the latter any characteristic, however slight, which makes it what it is, is thereby used for manufacturing purposes.

VIII.

"Saccharine," an acid, used for manufacturing purposes, was necessarily used as an acid for manufacturing purposes.

If the Court below was influenced by any such consideration as that a use for sweetening is not a use *as an acid*, it seems quite sufficient to dispel that idea by the argument that if "saccharine" *be* an acid, its prevailing uses are uses *as* an acid. Not all acids are alike. Not all are sour. Not all are used to make salts or other chemical compounds. Who shall say what are acid uses, or uses *as acids?* We think it palpable that there is no safe or sensible test save to ascertain whether or not a body *is* an acid, in which event its uses must be scheduled among the list of acid uses, even if they be totally different from the uses of any other known acid. May it not well have been with a realization how difficult of application any such test would be, that Congress carefully omitted a provision for applying any such test? At all events it *was not* provided by Congress, and must therefore not be required by courts in giving effect to the statute.

In the light of these considerations, how unimportant becomes the suggestion of the Court below: "Surely, no one who makes the chewing tobacco, the liquors, or the preserves referred to in the testimony, if asked the question, 'Do you use any acids in your process of manufacture'? would answer in the affirmative, on the strength of the fact that he uses this saccharine to sweeten his products!" No case should be decided on hypothetical testimony; much less on hypotheses evolved by the judicial mind and not even submitted to a witness. If any one had, under the supposed circumstances, answered as the Court thought he would have answered, it is evident, from the facts, that he would have been wrong as

to what constituted a use in his process of manufacture, and from the preponderance of testimony, that he would have been misinformed in not supposing "saccharine" to be an acid.

The plaintiffs in error have fully proved, as they maintain, that saccharine *is* an acid, and *is* used for manufacturing purposes, and no assumption can be raised against this proof by merely asserting that one who used it might deny the facts if questioned on the subject.

IX.

Upon all these considerations, we think it is evident that the Court below erred in its view of the law, and, in directing the jury to find a verdict for the defendant in error, vitally prejudiced the rights of the plaintiffs in error. We ask that the judgment be reversed, and the case remanded, with a direction to set aside the verdict and order a new trial.

ALBERT COMSTOCK,
Of Counsel.

COMSTOCK & BROWN,
Attorneys for Plaintiffs in Error.

Office Supreme Court U. S.
FILED.
MAR 27 1894
JAMES H. McKENNEY,
CLERK.

In the Supreme Court of the United States.

OCTOBER TERM, 1893.

HENRIETTA LOUISE LUTZ ET AL., administrators, etc., plaintiffs in error,
v.
DANIEL MAGONE, COLLECTOR OF the port of New York.
} No. 336.

IN ERROR TO THE CIRCUIT COURT OF THE UNITED STATES FOR THE SOUTHERN DISTRICT OF NEW YORK.

BRIEF FOR DEFENDANT IN ERROR.

In the Supreme Court of the United States.

OCTOBER TERM, 1893.

HENRIETTA LOUISE LUTZ ET AL., administrators, etc., plaintiffs in error,
v.
DANIEL MAGONE, COLLECTOR OF the port of New York.
No. 336.

IN ERROR TO THE CIRCUIT COURT OF THE UNITED STATES FOR THE SOUTHERN DISTRICT OF NEW YORK.

BRIEF FOR DEFENDANT IN ERROR.

This was an action to recover duties upon importations of saccharine in 1887. The case is therefore governed by the tariff act of 1883. It was tried before Judge Lacombe and a jury. A verdict was directed for defendant, and the importers assign errors.

STATEMENT OF FACTS.

The collector classified the articles imported under paragraph 92:

> All preparations known as essential oils, expressed oils, distilled oils, rendered oils, alkalies, alkaloids, and all combinations of any of the foregoing, *and all chemical compounds and salts by whatever name known*, and not specially enumerated or provided for in this act, twenty-five per centum ad valorem.

The importers claimed that they should be on the free list under paragraph 594:

> *Acids* used for medicinal, chemical, or manufacturing purposes, not specially provided for or enumerated in this act.

On the trial the collector claimed that they were proprietary preparations under paragraph 99:

> *Proprietary preparations*, to wit, all * * * preparations or compositions recommended to the public as proprietary articles, or prepared according to some private formula as remedies or specifics for any disease or diseases or affections whatever affecting the human or animal body, * * * not specially enumerated or provided for in this act, fifty per centum ad valorem.

The substance imported is commonly known as saccharine. It was invented about 1879 (p. 23). Its chemical name, according to these plaintiffs' advertisement, is "orthosulphamin benzoic acid anhydrid," and the last step in its manufacture is the separation from "orthosulphaminic benzoic acid" of the water therein contained (p. 20). It would thus be, chemically speaking, the anhydrid of orthosulpham-

inic benzoic acid. It is hardly an acid in the popular sense of the term, for it is claimed by the manufacturers to be three hundred times as sweet as sugar (pp. 13, 16, 17; Exh. D, opposite p. 34). It is a patented article, and therefore made by a known formula. Plaintiffs are the American agents of the sole manufacturer (pp. 11, 19). It is "a dry, white powder, sweet to the taste" (p. 11), and worth $13 to $15 a pound (p. 12). It is "used as a sweetening agent in manufacturing purposes." This is its chief use. In manufactures it is not used to form any chemical salts, but is simply intermixed with soda water, liquors, wines, tobacco, licorice, preserves, etc., on account of its intensely sweet taste (pp. 13, 14). That is its main use, but it is used in medicine to cover a bitter taste; having, however, "no medicinal effect on the human or animal system." Its only use is for sweetening (pp. 14, 15).

Charles Schmidt, plaintiffs' "bookkeeper and chemist," testified that, "chemically," saccharine was an acid (p. 11); that it turned blue litmus paper red, which only acids could accomplish; that he did not know whether he would call it an anhydrid or not; that an acid was a substance which formed with a basic body a chemical salt; that there was sometimes water in it and sometimes not; that, "to the best of his knowledge, he would swear that saccharine like sample S was an acid" (p. 12); that "anhydrid" meant "free from water;" that an acid might be at the same time an acid and an anhydrid; that an acid anhydrid was the same as anhydrous acid; that it was simply a waterless acid (pp. 13, 14).

Frederick Hoffman, a chemist, testified for plaintiffs that saccharine would neutralize an alkaline such as bi-

carbonate of soda. It effervesced, and the carbonate acid was set free and saccharine formed [*sic*]; "that the result of such tests was to show that it was chemically an acid" (p. 14); that "anhydrid" was a chemical term which meant very little; that it meant free of water; that all acids are anhydrid; that most acids were known in all three states, anhydrous, neutral, and with water, but there was no difference between an anhydrid and an acid anhydrid; "that in chemistry anything was called an acid that had the decided characteristics of an acid, and a simple test for determining if a thing was an acid, which any man could make, was with bicarbonate of soda."

Hayden M. Baker, defendant's witness, a practical chemist, though without a diploma, testified that he was familiar with the nature of acids; that "according to the understanding of chemical men" saccharine was an anhydrid and not an acid (p. 17); "that he could not consent to the proposition that there might be an acid properly such to which the prefix anhydro was applicable;" that an acid, when the water was removed from it, became an anhydrid (p. 18).

Defendant also put in evidence plaintiffs' circular purporting to describe the origin, manufacture, general nature, and uses of saccharine, and also the three patents obtained for saccharine by its inventor, Dr. Fahlberg, as well as the label used by them. In not one of these documents is saccharine called an acid, although it is called a compound.

The circular recommends it as meeting "two important *desiderata* hitherto not supplied by any product of

nature or art, namely, intense sweetness to the taste and perfect immunity to the human organism." The various steps in the manufacture are set forth, the last step having been hereinabove described. It is stated to be a white powder, partly of an amorphous, partly of a crystalline structure, having a slight odor like oil of bitter almonds, and being slightly soluble in cold water, having an intensely sweet taste and "an acid reaction upon litmus." It is stated to be the sweetest substance known, exceeding cane sugar in this respect 280 times, and yet passing through the human system without absorption or alteration, and as being an antiseptic, valuable in disorders of the digestive and alimentary passages. It is stated to be "neither a drug nor a food," but a neutral and indifferent substance and of "paramount value whenever a bitter taste has to be neutralized or counteracted;" of particular value in medicine to disguise the bitter taste of alkaloids such as quinine, morphine, etc., and especially "an invaluable boon to all persons afflicted with diabetes" for sweetening their food (pp. 19–21).

In its patents it is called "a new and useful compound" or "a saccharine compound from toluene and other derivatives of coal-tar," otherwise known as "benzoic sulfinide" (p. 23.) It is called "a derivative of benzoic acid" (p. 24) or "a colorless, finely crystallized product of characteristic sweetness" (p. 26.) Its scientific name is given as "the new saccharine compound benzoic sulfinide," the chemical formula of which is $C_7H_5O_3SN$ (p. 27.) The claim in the patent states as the last step in manufacture "separating the pure saccharine compound from its salts by acids, acid salts, and hydrogen sulphide" (p. 28.)

In the second patent the invention described is "a saccharine compound, consisting of a mixture of starch or grape sugar and benzoic sulfinide, substantially as and for the purposes set forth (p. 29). The third patent is substantially similar to the first.

ARGUMENT.

I.

Saccharine is not an acid within the meaning of the tariff act.

A verdict having been directed for defendant upon conflicting evidence as to chemical designation, it must be conceded here that in the technical language of chemistry saccharine is properly classifiable under the head of acids. It does not appear, however, that even a chemist would ever speak of it colloquially as "*an* acid," although in describing its qualities he would use the word "acid" *as an adjective.* We have four lengthy descriptions of the article by the inventor or his agents, these plaintiffs, and not one of them ever refers to the article as "an acid," although it is stated to have "an acid reaction." The nearest approach is the statement of the advertising circular that it is an acid anhydrid, but "acid anhydrid" is no nearer to "acid" than "acid reaction" or "acid salts," other phrases used in these same documents. "Acid anhydrid" is used in the circular as opposed to "acid" pure and simple.

The testimony of plaintiffs' witnesses amounts simply to saying that this dry and intensely sweet powder is properly classified in the very complex and technical lore of organic chemistry among acids, although when chemists

speak of it they call it a "compound" or a "substance." But Congress, it is respectfully submitted, had no such scientific system in mind. It "did not suppose our merchants to be naturalists or geologists or botanists" (200 *Chests of Tea*, 9 Wheat., 430, 438), nor did it expect "scientific knowledge and investigation" of custom-house officers. (*Mason* v. *Robertson*, 139 U. S., 624, 627.) Thus a bean is not a seed within the tariff acts, although it is a seed "in the language of botany or natural history." (*Robertson* v. *Salomon*, 130 U. S., 412, 414.) "Botanically speaking, tomatoes are the fruit of a vine," but that does not make them fruit within these acts. (*Nix* v. *Hedden*, 149 U. S., 304, 307.)

The word "acid," like the word "mineral," as used by Congress, is "not technical, either as having a special sense by commercial usage, nor as having a scientific meaning different from [its] popular meaning." (See *Marvel v. Merritt*, 116 U. S., 11.) Webster's definition does not require the inclusion of every chemical compound under the head of acids which can change blue to red litmus paper, or with which an expert can produce a salt by proper combinations in the laboratory. His last edition clearly distinguishes anhydrids from acids.

> *Anhydride.* An oxide of a nonmetallic body or an organic radical, *capable of forming an acid* by uniting with the elements of water; * * * so called because it may be *formed from an acid* by the abstraction of water.
>
> *Saccharine.* A trade name for benzoic sulphinide. (See also definitions of *Saccharin* and *Lactone.*)
>
> *Sulphinide.* A substance with *acid qualities. Remsen.*

These definitions accord with plaintiffs' own use of the words, and the citation seems to be from one of the inventors of the patented preparation. (Record, p. 23.)

Nor does the Century Dictionary treat it as an acid:

> *Saccharin.* * * * 2. A complex benzin derivative, benzoyl sulphinide $C_6 H_4 SO_2 CONH$. It is a white crystalline solid, etc.

If the broad definition of acid is to be taken, very strange results may follow. Thus, in the Encyclopedia Britannica, under the head of acids (Vol. I, p. 91, ed. 1875), we have the following statement with regard to *flint:*

> It * * * is a true acid, because, when it is heated along with soda or lime, it forms the new body commonly called glass, which is chemically a salt of silicic acid.

It is respectfully submitted, first, that in the ordinary meaning of the English language a dry powder never used in chemical combinations, of a sweet taste, and used only for sweetening by mechanical admixture, is not an acid; second, that to rate it as an acid there should at least be some evidence that, in what may be called the colloquial language of scientific men, the word acid is familiarly applied to it as a noun and not as a mere adjective; and third, that neither witness goes as far as this, while the documentary evidence makes to the contrary.

Presumptively the scientific meaning, like the commercial meaning (*Swan* v. *Arthur* 103 U. S., 597; *Maddock* v. *Magone* U. S. S. C., Mar. 12, 1894), is the same as that understood by the unlearned.

II.

Whether or not an acid, it is submitted that saccharine is not shown to be used for medicinal or manufacturing purposes within the meaning of the act.

While advertised as having antiseptic qualities, there is no testimony that it is ever actually used in that way. Sweetening a dose of medicine to make it taste good seems hardly a medicinal purpose.

As to the claim that it is used for manufacturing purposes, we simply quote the oral opinion of Judge Lacombe on this point (*Lutz* v. *Magone*, 41 Fed. Rep., 128, 130):

> Now, it appears that this article is mechanically combined with various other substances in the course of their manufacture, for the sole purpose of sweetening, which it does by its mere presence, being added, unchanged in condition, to the article with which it is mixed. That may be a manufacturing purpose, and when so combined, the result may be a manufacture; but the saccharine is not thereby *used as an acid* in manufacture. The meaning of this paragraph seems to be that acids, which are used for the reason that, *by their chemical combination with other articles*, they produce substances medicinal, substances chemical, or substances which are regarded as the fruits of manufacture, are to be admitted free. But this article, when used for manufacturing purposes, is not used as an acid at all. The article, saccharine, is mechanically combined or diluted with other articles, and the resultant articles are pleasant to the taste by reason of the circumstances of their being sweetened with the saccharine; but saccharine so used can not be fairly maintained, under the

phraseology of this paragraph, to be an "acid used for manufacturing purposes." Surely no one who makes the chewing tobacco, the liquors or the preserves referred to in testimony, if asked the question, "Do you use any acids in your process of manufacture?" would answer in the affirmative, on the strength of the fact that he uses this saccharine to sweeten his products.

Under plaintiff's theory it is difficult to perceive why the words "used for medicinal, chemical, or manufacturing purposes" were required in paragraph 594.

III.

The article is a proprietary preparation; a preparation or composition recommended to the public as a proprietary article. Within paragraph 99 of the tariff act it is certainly a preparation or composition; it is certainly proprietary; it is actually patented. Being patented, the formula, of course, is not secret, but it is private, that is, it can be used only by the patentee. It is not necessary, however, to bring an article within paragraph 99, that it should belong to the class of compositions "prepared according to some private formula as remedies or specifics," etc. It is sufficient if it is recommended to the public as a proprietary article. (See *Ferguson* v. *Arthur*, 117 U. S., 482, 488.) The formula is, however, a private one as long as the patent runs, and the article is recommended as a remedy in diseases of the digestive and alimentary passages, etc. (p. 21). Recommendation, not necessarily actual use, is required for the purposes of this paragraph.

IV.

Assuming that the article is an acid, but that it is also a proprietary article, the latter clause governs under § 2499 of the Revised Statutes as amended in 1883, providing that "if two or more rates of duty should be applicable to any imported article, it shall be classified for duty under the highest of such rates." (*Liebenroth* v. *Robertson*, 144 U. S., 35, 40; *Dieckerhoff* v. *Robertson*, 40 Fed. Rep., 568; *In re Wertheimer*, 55 Fed. Rep., 281.)

V.

None of the exceptions to evidence require a reversal.

Most of the exceptions relate to the admission in evidence of the patents and label. The advertising circular, admitted without exception, referred to the patents and showed that plaintiffs were the sole agents of the patentee (p. 19). The patents themselves thus became competent testimony, and they were relevant as bearing on the true nature and designation of the articles. The patents and label were also relevant as showing the proprietary character of the articles.

Another exception is to the exclusion of pages 268 and 268 of Roscoe and Schorlemer's Treatise on Chemistry, vol. 3. These pages were offered simply "for the purpose of showing that saccharine is there classed as an acid" (p. 15). Assuming that we are sufficiently informed as to the contents of these pages to raise the question of their admissibility (*Clement* v. *Packer*, 125 U. S., 309,

320), the question is not here material, as the evidence offered was merely cumulative in character, and the case was not left to the jury. Plaintiffs' witnesses had already testified that the importations were classifiable in chemistry as acids. If that testimony was insufficient to take the case to the jury, nothing further is added in legal effect by a repetition of the same statement in a printed book. We, therefore, do not discuss the authorities holding that scientific books can not be put in evidence. (Cases cited in Lawson on Expert and Opinion Evidence, p. 168; 7 Am. & Eng. Enc. of Law, p. 513; 1 Croswell's Greenleaf on Evidence, 15th ed., pp. 579–80.) These decisions have been severely criticised, but it seems to be admitted that if they are wrong in principle, the remedy is by statutory amendment. (*Id.*, p. 645; "Scientific books in evidence," by J. H. Wigmore, 26 Am. Law Rev., pp. 390–403.)

The last exception is to the admission of the testimony of defendant's witness, Hayden M. Baker. His testimony was entirely expert in nature. The exception is to his competence as a witness. He admitted that he was "not a college-bred man, and had never studied chemistry to the point of receiving a diploma;" that he had received a complimentary degree and called himself a chemist "by the right of his experience." It appeared, however, that he for the last ten years had been a chemist in the employ of the U. S. Government at the appraiser's stores in this city; that during that time his duties had been to examine and identify all kinds, or nearly all kinds, of chemical compounds imported; that for seventeen years

prior to his employment by the U. S. Government he had been engaged in experimental chemistry, and most of his efforts were directed to the study of aniline colors *and the products of coal tar* (p. 17). The article in suit is manufactured "from toluene and other derivatives of coal tar" (p. 23).

The exception is unavailable for various reasons:

(1) The qualifications of a witness offered as an expert are peculiarly a matter for the trial court to determine, and the appellate court will interfere only in a strong case. (*Spring Co.* v. *Edgar*, 99 U. S., 645, 658; *Stillwell Manufacturing Co.* v. *Phelps*, 130 U. S., 520; *Montana Railway Co.* v. *Warren*, 137 U. S., 348, 353; *Inland and Seaboard Coasting Co.* v. *Tolson*, 139 U. S., 551, 559; *Chateaugay Iron Co.* v. *Blake*, 144 U. S., 476, 484; and cases cited in 1 Croswell's Greenleaf on Evidence, 15th ed., pp. 577-578.)

(2) It is not necessary to constitute an expert that he should have gone through any course of special study. Either study or practice is sufficient to make a case for the consideration of the trial court. (Lawson on Expert and Opinion Evidence, p. 210; *Nelson* v. *Sun Mutual Insurance Co.*, 71 N. Y., 453, 460; *Pearson* v. *Zehr*, 138 Ill., 48.)

(3) A verdict having been directed in favor of the defendant, the testimony of Mr. Baker became absolutely immaterial. His testimony simply related to the question whether an anhydrid could properly be classified chemically as an acid. The direction of the verdict impliedly decided that this testimony was immaterial. To support

the direction, Baker's testimony must be thrown out of consideration. If the direction of the verdict be correct, its admission did no injury.

It is respectfully submitted that the judgment should be affirmed.

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